Access DB# 99471

SEARCH REQUEST FORM

1/6

Scientific and Technical Information Center

Requester's Full Name: Chongshan Chen Examiner #: 79547 Date: 7/17/03
Art Unit: 2172 Phone Number 30 5-8319 Serial Number: 09/842,370
Mail Box and Bldg/Room Location: 4B25 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Reticle Management System

Inventors (please provide full names): Oren Wiesler, Thomas Mariano

Earliest Priority Filing Date: 4/25/2000

For Sequence Searches Only *Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

An apparatus for managing data corresponding to a plurality of reticles in a semiconductor manufacturing system including a plurality of processing stages, the apparatus comprising:

a central reticle database configured and arranged to store data associated with each of the plurality of reticles;

a reticle management controller coupled to the central reticle database, the reticle management controller configured and arranged to store and retrieve data from the central reticle database;

an attribute identifying the maximum number of cleanings of a reticle;

" " " the maximum number of inspection of a reticle;

" " " the maximum number of uses of a reticle between inspections;

" " " the max number of use of a reticle between cleaning;

" " " the max time between inspection of a bare reticle;

" " " the max time between cleanings of a bare reticle;

" " " the max time between inspections of a kitted reticle;

" " " the max time between cleanings of a kitted reticle;

****

STAFF USE ONLY

Searcher: Geoffrey Letscher
Searcher Phone #: 308-7800
Searcher Location: 4B30
Date Searcher Picked Up: 7/23/3
Date Completed: 7/25/3
Searcher Prep & Review Time: 50 min
Clerical Prep Time:
Online Time: 175 min

PTO-1590 (8-01)

Type of Search

NA Sequence (#)
AA Sequence (#)
Structure (#)
Bibliographic ✓
Litigation
Fulltext ✓
Patent Family
Other

Vendors and cost where applicable

STN
Dialog ✓
Questel/Orbit
Dr.Link
Lexis/Nexis
Sequence Systems
WWW/Internet ✓
Other (specify)

STIC Search Report
EIC 2100

STIC Database Tracking Number: 99471

TO:	From:
Chongshan Chen **Location: 4B25** **Art Unit : 2172** **Friday, July 25, 2003** **Case Serial Number: 09/842370**	**Geoffrey St. Leger** **Location: EIC 2100** **PK2-4B30** **Phone: 308-7800** **geoffrey.stleger@uspto.gov**

Search Notes

Dear Examiner Chen,

Attached please find the results of your search request for application 09/842370. I searched Dialog's foreign patent files, technical databases, product announcement files and general files; along with the Internet.

Please let me know if you have any questions.

Regards,

Geoffrey St. Leger

Geoffrey St. Leger
4B30/308-7800

STIC Search Results Feedback Form

EIC 2100

Questions about the scope or the results of the search? Contact ***the EIC searcher or contact:***

Anne Hendrickson, EIC 2100 Team Leader
308-7831, CPK2-4B40

Voluntary Results Feedback Form

- *I am an examiner in Workgroup:* ☐ *Example: 3730*
- *Relevant prior art **found**, search results used as follows:*
  - ☐ 102 rejection
  - ☐ 103 rejection
  - ☐ Cited as being of interest.
  - ☐ Helped examiner better understand the invention.
  - ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature
  (journal articles, conference proceedings, new product announcements etc.)

- *Relevant prior art **not found:***
  - ☐ Results verified the lack of relevant prior art (helped determine patentability).
  - ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

BEST AVAILABLE COPY

Drop off or send completed forms to STIC/EIC2100 CPK2-4B40

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File 275:Gale Group Computer DB(TM) 1983-2003/Jul 24
         (c) 2003 The Gale Group
File 621:Gale Group New Prod.Annou.(R) 1985-2003/Jul 24
         (c) 2003 The Gale Group
File 636:Gale Group Newsletter DB(TM) 1987-2003/Jul 24
         (c) 2003 The Gale Group
File  16:Gale Group PROMT(R) 1990-2003/Jul 24
         (c) 2003 The Gale Group
File 160:Gale Group PROMT(R) 1972-1989
         (c) 1999 The Gale Group
File 148:Gale Group Trade & Industry DB 1976-2003/Jul 24
         (c)2003 The Gale Group
File 624:McGraw-Hill Publications 1985-2003/Jul 24
         (c) 2003 McGraw-Hill Co. Inc
File  15:ABI/Inform(R) 1971-2003/Jul 24
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File 647:CMP  Computer Fulltext 1988-2003/Jun W5
         (c) 2003 CMP Media, LLC
File 674:Computer News Fulltext 1989-2003/Jul W3
         (c) 2003 IDG Communications
File 696:DIALOG Telecom. Newsletters 1995-2003/Jul 23
         (c) 2003 The Dialog Corp.
File 369:New Scientist 1994-2003/Jul W2
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File 810:Business Wire 1986-1999/Feb 28
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File 813:PR Newswire 1987-1999/Apr 30
         (c) 1999 PR Newswire Association Inc
File 610:Business Wire 1999-2003/Jul 24
         (c) 2003 Business Wire.
File 613:PR Newswire 1999-2003/Jul 24
         (c) 2003 PR Newswire Association Inc

Set     Items   Description
S1      12957   RETICLE? ? OR PHOTOMASK? ? OR PHOTO()MASK? ?
S2         97   S1(5N)(DATABASE? ? OR DATA()BASE? ? OR DBM OR DBMS OR RDBM
                 OR RDBMS OR REPOSITOR??? OR DIRECTORY OR DIRECTORIES OR DATA(-
                 )STORE? ? OR SERVER? ? OR TABLE? ? OR LIST????)
S3    2421517   SEMICONDUCT??? OR SEMI()CONDUCT??? OR CHIP?? OR MICROCHIP??
                 OR CIRCUIT? ? OR IC OR PCB OR ASIC OR WAFER? ? OR SUBSTRATE?
                 ?
S4         79   S2(S)S3 OR S2(100N)S3
S5         43   RD (unique items)
S6         32   S5 NOT PD>20000425
S7        526   S1(3N)(MANAG??? OR MANAGEMENT OR INVENTOR???)
S8        578   S1(10N)(INSPECT?? OR CLEAN????) OR BARE(1W)S1 OR (KITTED OR
                 PREKITTED)(1W)S1
S9         84   S7 AND S8
S10        36   RD (unique items)
S11        13   S10 NOT PD>20000425
S12       133   RETICLE()MANAGEMENT
S13         8   S2 AND S12
S14         6   RD (unique items)
S15        62   S2 NOT (S6 OR S11 OR S14)
S16        34   RD (unique items)
S17        23   S16 NOT PD>20000425
S18       123   S1(5N)TRACK???
S19        33   S8 AND S18
S20        14   RD (unique items)
S21         6   S20 NOT PY>20000425
```

6/9/23 (Item 7 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

01644649 Supplier Number: 42034972 (THIS IS THE FULLTEXT)
Offers Wafer, Reticle Transport Unit
Electronic News (1991), p19
April 29, 1991
ISSN: 1061-9577
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 325
TEXT:
BILLERICA, Mass. -- Precision Robots Inc. has begun offering a line of wafer and reticle transport systems designed to allow automated materials handling in device fabrication facilities.

Resembling an intelligent model railroad layout, the system combines PRI's 7000 series work-in-progress stockers with overhead monorail transports built by ProgramMation Inc. Wafers being processed are carried from bay to bay within the fab by the monorails; upon arrival, they are stored in a stocker.

Other intra-bay robots can then be used to move the **wafers** into process stations. When the process is completed, the **wafer** cassette can be returned to the stocker and sent along to the next bay.

In addition to providing hands-off transport of **wafers** , the package can identify **wafers** or lots and track material location. Reticles for **wafer** steppers can also be transported.

PRI builds the model 7300 mini-stocker, which can provide a buffer for a single bay or workcell, and the 7500 stocker, with five times the storage space. The 7500 can also be extended to serve as a central large-capacity **repository** . For **reticle** storage and retrieval, the 7700 reticle management system is used.

Wafer handling within a process bay is performed by PRI's floor-mounted RoboTrack cassettes from the local stocker and moves them to process equipment, **wafer** transfer stations or test stations.

ProgramMation's ProgrammaTrack monorail uses small battery-powered cars, equipped with microprocessors, to carry material. The transport lines are usually attached to walls or ceilings, and are controlled by a central host computer. Cars can be configured to hold **wafer** cassettes, cassette boxes, SMIF pods or reticle boxes.

A PRI spokeswoman said several orders had already been received for the system, which is available immediately. Pricing is greatly variable depending on the capabilities required, but the spokeswoman cited a figure of $3 million to $5 million to automate an entire fab with 10 to 20 bays. This includes overhead transport lines and one WIP stocker in each bay, but not intra-bay transport robots.

6/3,K/1 (Item 1 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)
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02251616 SUPPLIER NUMBER: 53380948 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Intel Outlines High-End Roadmap. (development plans for high-end processors) (Company Business and Marketing)
Microprocessor Report, 12, 14, NA
Oct 26, 1998
ISSN: 0899-9341 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 3484 LINE COUNT: 00265

... reduces its latency and makes it easier to run at the full CPU speed. It also reduces manufacturing cost by eliminating the costly custom cache **chips** that Intel fabricates for today's Xeon. Intel will probably deploy multiple versions of Cascades, with L2 cache sizes including 512K, 1M, and possibly larger. The larger cache sizes, however, may not appear until early 2000.

The challenge for Cascades is whether Intel can add enough L2 cache for large **server** applications without exceeding the maximum **reticle** size, which limits **chips** to about 500 mm2. We estimate the die size of a Cascades with 1M of L2 cache to be about 250 mm2, moderately large but...

6/3,K/2 (Item 2 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)
(c) 2003 The Gale Group. All rts. reserv.

02223126 SUPPLIER NUMBER: 21172836 (USE FORMAT 7 OR 9 FOR FULL TEXT)
THe fab Line. (News Briefs)
Fasca, Chad; McGrath, Dylan
Electronic News (1991), v44, n2238, p40(1)
Sept 28, 1998
ISSN: 1061-9577 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 495 LINE COUNT: 00044

... San Jose, Calif., introduced the 362 Automated Reticle Inspection System for advanced optical proximity correction (OPC) photomasks. KLA-Tencor said the 362 provides die-to- **database** inspection of complex OPC **photomasks** through a new defect detection algorithm, data preparation and rendering improvements, and defect review enhancements. DuPont Photomasks beta tested the 362 at its photomask production...

...patented gas purge technology into Fluoroware's 300mm AutoPod front-opening unified pod (FUOP). The financial terms of this agreement were not disclosed. While no **Semiconductor** Equipment and Materials International (SEMI) standards currently exist for gas purge, the International 300mm Initiative (I300I) is holding technical meetings on the topic. Fluoroware and...

6/3,K/3 (Item 3 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)
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02033209 SUPPLIER NUMBER: 19096854 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Photronics details capability investments. (Photronics and MicroUnity Systems Engineering making photomasks) (Company Business and Marketing)
Bradley, Gale
Electronic News (1991), v43, n2152, p29(2)
Jan 27, 1997
ISSN: 1061-6624 LANGUAGE: English RECORD TYPE: Fulltext; Abstract
WORD COUNT: 1714 LINE COUNT: 00146

...ABSTRACT: producing full-field photomasks with optical proximity corrected (OPC) features. MicroUnity's EBView and MaskRigger OPC software lets designers add sub-lithographic features to full **IC** designs. Because these features can then be applied to all layers and features of a

photomask set, pattern distortion is minimized. Die-to- **database** inspection insures that the **photomasks** meet customers' exacting standards. Sun Microsystems lauds the companies' approach, which it foresees raising the production yields of high-end microprocessors. Photronics uses its UltraRes...

Photronics and MicroUnity Systems Engineering, a privately-held company in Sunnyvale, Calif., are producing and delivering full-field, die-to- **database** inspected **photomasks** with OPC features utilizing certain MicroUnity OPC software, the two said.

Working with certain unnamed manufacturers, Photronics manufactured the higher-end photomasks employing resources from...

...created with MicroUnity's proprietary OPC and pattern enhancement software.

MicroUnity's MaskRigger and EBView software allows designers to add sub-lithographic features to entire **IC** designs, features that can be applied across all features and layers of a photomask set. The result is a method that minimizes the fundamental causes...

6/3,K/4 (Item 4 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)

01675327 SUPPLIER NUMBER: 15082115 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Submicron expense vexes industry. (semiconductor fabrication facilities)
Dorsch, Jeff
Electronic News (1991), v40, n2006, p1(2)
March 21, 1994
ISSN: 1061-6624 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 1203 LINE COUNT: 00097

... DRAM lithography, Peter Silverman of Intel said, "We view cost of ownership as key to driving down the costs of process technolgy." Like many other **chip** makers, Intel is employing cost-of-ownership models in designing and equipping its fabs, he added.

The time necessary in getting a fab built, equipped...

...a month off (the schedule) is critical."

John G. Skinner of Du Pont Photomasks noted there are several key cost factors in producing photomarks and **reticles** today: larger **databases** required for optical proximity correction (OPC); longer mask-writing times to account for OPC; limited tool availability; more measurements; and higher **substrate** costs.

Cost reductions can be achieved through a number of ways, he suggested, such as minimizing mask levels through tighter specifications, optimizing mask job organization...

6/3,K/5 (Item 5 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)

01375889 SUPPLIER NUMBER: 09519053 (USE FORMAT 7 OR 9 FOR FULL TEXT)
KLA offers in-line wafer inspector. (KLA Instruments Corp.'s KLA 2110 wafer inspection system) (product announcement)
Chilton's Electronic News, v36, n1831, p29(1)
Oct 15, 1990
DOCUMENT TYPE: product announcement ISSN: 1054-6847 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 490 LINE COUNT: 00039

ABSTRACT: KLA Instruments Corp has introduced its $995,000 KLA 2110 **wafer** inspection system for in-line inspection and process verification. The 2110, which is the first in KLA's 2100 series of systems, has 0.25 micron sensitivity and can handle 8-inch **wafers** . The system provides throughput 100 times faster than previous KLA systems and is fast enough to inspect DRAMs, SRAMs, EPROMs, EEPROMS and gate arrays. The 2110's class 1

environment robot handler includes both English and Kanji user interfaces. The system's common **data base** capability allows the **photomask** and **wafer** inspection systems to unify their defect data. The 2110 comes configured for DRAM inspection using digital image processing, and later systems will also handle logic...

6/3,K/6 (Item 6 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)

01144493 SUPPLIER NUMBER: 00619630
Standards Groups Set Show Meeting.
Electronic News, v31, n1549, p2SW
May 13, 1985
ISSN: 0013-4937 LANGUAGE: ENGLISH RECORD TYPE: ABSTRACT

...ABSTRACT: SEMI Standards Program subcommittees will be meeting at the Semicon-West '85 trade show. The subcommittees are developing standards to cover the following areas of **semiconductor** manufacture: chemicals, equipment, materials, packaging, and **photomasks** . A **list** of the subcommittees meeting at Semicon-West is included.

6/3,K/7 (Item 1 from file: 621)
DIALOG(R)File 621:Gale Group New Prod.Annou.(R)

01765816 Supplier Number: 53292233 (USE FORMAT 7 FOR FULLTEXT)
Applied Materials Introduces Next-Generation Reticle Inspection System.
Business Wire, p0307
Dec 1, 1998
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 359

... inspection system, the ARIS-i. Targeted for advanced reticles used in 0.18-micron and below device generations, the ARIS-i provides mask makers and **semiconductor** manufacturers with a high-productivity, low cost-of-ownership (COO) system with unmatched data handling capability.
The ARIS-i system's high-speed data handling...

...optical proximity correction (OPC) and phase shift. The system's improvements in data management give it the industry's fastest performance in critical die-to- **database** inspection, which compares the **reticle** 's features directly with the reticle's design.
"The ARIS-i system places users at the forefront of mask inspection technology in finding the smallest...

6/3,K/8 (Item 2 from file: 621)
DIALOG(R)File 621:Gale Group New Prod.Annou.(R)

01711509 Supplier Number: 53018467 (USE FORMAT 7 FOR FULLTEXT)
KLA-Tencor Introduces Advanced Inspection Technology for OPC Photomasks.
Business Wire, p1336
Sept 21, 1998
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 450

The 362 provides superior die-to- **database** inspection of complex OPC **photomasks** through a new defect detection algorithm, data preparation and rendering improvements, as well as defect review enhancements.
Photomasks have been identified as an enabling technology...

...complexity continues to increase with sub-micron linewidths, complex OPC

shapes and tighter specifications. Subtle defects on or near OPC structures can transfer to the **wafer** , ultimately impacting yields. These challenges require improved inspection capabilities to build and ensure high quality photomasks.

The 362 meets these challenges with a new defect...

...our customers early access to critical photomask technologies."

An extension of KLA-Tencor's proven 300 Series platform, the 362 compares etched geometries on the **photomask** with a matching **database** within the inspection system. 300 Series systems can be field upgraded to the 362.

About KLA-Tencor

KLA-Tencor is the world leader in yield management and process control solutions for **semiconductor** manufacturing and related industries. Headquartered in San Jose, Calif., the company has sales and service offices around the world. An S&P 500 company, KLA...

6/3,K/9 (Item 3 from file: 621)
DIALOG(R)File 621:Gale Group New Prod.Annou.(R)

01675671 Supplier Number: 50161272 (USE FORMAT 7 FOR FULLTEXT)
New Productivity Enhancement Software and Engineering Services Offered to IC Makers at Pay-For-Results Pricing.
Business Wire, p07130401
July 13, 1998
Language: English Record Type: Fulltext
Article Type: Article
Document Type: Newswire; Trade
Word Count: 1042

... appropriate lots for the current work in progress.

TEFEN's reticle management software is a decision-support tool for the lithography system operator on the **wafer** fabrication line. It uses a "look ahead" approach to predict which lots are coming into their equipment and which are needed. This "look ahead" data...

...the beginning of every shift and allocates the optimal ratio of reticles to steppers. The linear programming module then presents to the operator a computerized **list** of instructions for each **reticle** transaction in priority order.

"Simply stated, our Reticle Management System puts the right reticle at the right machine at the right time to maximize the yield of expensive lithography systems, produce fewer errors, and reduce the overall cost of owning and operating a **semiconductor** lithography system," said TEFEN's Albalak.

TEFEN is an international leader in industrial engineering and systems analysis. Founded in 1982, the company has amassed a worldwide reputation for success in improving and enhancing the production process of numerous **semiconductor** and electronics manufacturers. TEFEN's expertise included modeling facility layout and continuous productivity improvement. The company's client list includes some of the world's...

6/3,K/10 (Item 4 from file: 621)
DIALOG(R)File 621:Gale Group New Prod.Annou.(R)

01623928 Supplier Number: 48364801 (USE FORMAT 7 FOR FULLTEXT)
KLA-Tencor Extends Reticle Quality Management Through the Photolithography Process.
Business Wire, p03190293
March 19, 1998
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 592

... Through Photolithography Requalification
KLA-Tencor Corp.(Nasdaq: KLAC) today introduced the SL3 STARlight (simultaneous transmitted and reflected light) contamination inspection system and the Model 91 **reticle** inspection data management **server** , key contributors to KLA-Tencor's reticle quality management (RQM) technology. A comprehensive RQM solution can provide consistent photomask contamination inspection for the life of...

...leaves the photomask manufacturer through multiple uses in the fab lithography process.
Regularly scheduled photomask inspection helps prevent mask degradation that can result in either **wafer** yield excursions or decreased yield value from lower device performance. The SL3 is designed to perform final reticle inspections prior to shipment from the mask manufacturer, as well as mask inspections at **wafer** fab incoming quality control (IQC) and photolithography process requalification. The Model 91, in addition to storing, displaying and printing photomask inspection results, provides a vital...

6/3,K/11 (Item 5 from file: 621)
DIALOG(R)File 621:Gale Group New Prod.Annou.(R)

01479813 Supplier Number: 47059518 (USE FORMAT 7 FOR FULLTEXT)
TOP SEMICONDUCTOR COMPANIES IMPLEMENT KLA STARLIGHT WITH URSA INSPECTION STRATEGY
News Release, pN/A
Jan 23, 1997
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 379

(USE FORMAT 7 FOR FULLTEXT)
TEXT:
...new multi-surface reticle inspection feature for the KLA STARlight system. URSA (Unpatterned Reticle Surface Analysis) is in full production and several companies in the **semiconductor** industry have placed product orders. STARlight with URSA will provide mask making facilities and **semiconductor** manufacturers a comprehensive, single-step inspection tool for their reticles. The STARlight inspection system is used to detect contamination defects on the patterned chrome surface...

...the pellicles and unpatterned glass surfaces of the reticle for contaminants and imperfections. Among the first to receive a STARlight/URSA system will be Rockwell **Semiconductor** Systems, a division of Rockwell International. "Traditionally, Rockwell would inspect incoming reticles using two systems - one for the patterned chrome surface and a second for ...

...world's largest manufacturer of photomasks. "URSA successfully integrates multi-surface inspections into the STARlight inspection system," commented Gil Shelden, director of engineering for DPI. " **Semiconductor** manufacturers rely on DPI to deliver the most advanced reticles free from defects. DPI is pleased to participate with KLA as part of our recently...

...the third significant reticle inspection product introduced by KLA within the last two years (STARlight, a reticle contamination inspection system; and Blackbird, a high-speed, **database** adapter for the KLA **reticle** pattern inspection system). "KLA is committed to providing yield management tools that help our customers achieve advancements in technology and productivity," stated Ed Grady, vice...

...of KLA's Reticle and Photomask Inspection Division. KLA Instruments is the world's leading manufacturer of yield management and process control systems for the **semiconductor** industry. KLA is a publicly held corporation, traded on the NASDAQ National Market under the symbol "KLAC."

6/3,K/12 (Item 6 from file: 621)
DIALOG(R)File 621:Gale Group New Prod.Annou.(R)

01022782 Supplier Number: 39709479 (USE FORMAT 7 FOR FULLTEXT)
KLA INTRODUCES THE KLA 229 SUB-MICRON INSPECTION SYSTEM
PR Newswire, pN/A
March 3, 1986
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 202

... most advanced photomask
and reticle inspection system with the highest sensitivity available today. The KLA 229, thethird generation of KLARIS systems which inspect to a **database** , improves defect detection sensitivity on **photomasks** , 1X reticles or glass **wafers** with sub-microngeometries.

The KLA 229 automatic photomask reticle inspection system, a combination of the KLA 209, the KLA 20, and a high-speed printer...

...to-database mode.

In die-to-die comparison, the KLA 229 performs high-speed automated inspection on photomasks, multi-die reticles, or chrome coated glass **wafers** for **reticle** qualification. In die-to- **database** comparison, it
inspects directly to an **IC** design database, allowing absolute verification of the optical **circuit** .

The latest addition to the KLARIS product family, the KLA 229 system extends the technology developed for its two predecessors-the KLA 228 and the...

6/3,K/13 (Item 1 from file: 636)
DIALOG(R)File 636:Gale Group Newsletter DB(TM)

04055136 Supplier Number: 53529578 (USE FORMAT 7 FOR FULLTEXT)
Next-Generation Reticle Inspection.
NDT Update, v7, n12, pNA
Dec, 1998
Language: English Record Type: Fulltext
Document Type: Newsletter; Trade
Word Count: 204

(USE FORMAT 7 FOR FULLTEXT)
TEXT:
...from Applied Materials, Inc., is targeted for advanced reticles used in 0.18-micron and below device generations. The ARIS-i provides mask makers and **semiconductor** manufacturers with a high-productivity, low cost-of-ownership system. The ARIS-i system's high-speed data handling capabilities and sensitivity down to 0...

...and phase shift. According to the company, the system's improvements in data management give it the industry's fastest performance in critical die-to- **database** inspection, which compares the **reticle** 's features directly with the reticle's design. The ARIS-i system also places users at the forefront of mask inspection technology in finding the...
...i to customers, and the company has already received commitments for ARIS-i systems that are scheduled to begin shipping in December. Applied Materials supplies **wafer** fabrication systems and services to the **semiconductor** industry. Contact: Betty Newboe, Applied Materials, Inc., 3050 Bowers Ave., Santa Clara, CA 95054; Tel: 408/563-0647, Fax: 408/748-9943.

6/3,K/14 (Item 2 from file: 636)
DIALOG(R)File 636:Gale Group Newsletter DB(TM)
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04005463 Supplier Number: 53163605 (USE FORMAT 7 FOR FULLTEXT)
Advanced Inspection for OPC Photomasks.
NDT Update, v7, n10, pNA
Oct 1, 1998
Language: English Record Type: Fulltext
Document Type: Newsletter; Trade
Word Count: 199

... complexity continues to increase with sub-micron linewidths, complex OPC shapes, and tighter specifications. Subtle defects on or near OPC structures can transfer to the **wafer** , ultimately impacting yields. These challenges require improved inspection capabilities to build and ensure high quality photomasks.

The 362 meets these challenges by providing superior die-to-**database** inspection of complex OPC **photomasks** with a new defect detection algorithm, data preparation, and rendering improvements, as well as defect review enhancements.

The new AOP110 algorithm has been optimized for...

...preparation and rendering speed improvements can reduce both cycle and inspection times of advanced databases.

KLA-Tencor supplies yield management and process control solutions to **semiconductor** manufacturers and related industries. Contact: Roberta Emerson, KLA-Tencor, 160 Rio Robles, San Jose, CA 95134; Tel: 408/875-3000, ext. 7037, Fax: 408/571...

6/3,K/15 (Item 3 from file: 636)
DIALOG(R)File 636:Gale Group Newsletter DB(TM)
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02053050 Supplier Number: 43746770 (USE FORMAT 7 FOR FULLTEXT)
PRODUCTION TECHNOLOGY - ASML ADVANCED RETICLE-MANAGEMENT SYSTEM
Integrated Circuits International, pN/A
April, 1993
Language: English Record Type: Fulltext
Document Type: Newsletter; Trade
Word Count: 205

(USE FORMAT 7 FOR FULLTEXT)
TEXT:
ASM Lithography (ASML) has recently announced a fast reticle-exchange system that makes it practical to expose multiple **circuit** patterns on a single **wafer** without a significant reduction in throughput. ASML's new Advanced Reticle Management System (ARMS), compatible with any PAS 5500 stepper, cuts in half the time...

...final exposure of one reticle to the first exposure of the next. In that time, ARMS quickly removes the previously exposed photomask, loads the next **photomask** onto the **reticle table** , and performs a complete through-the-lens alignment to the in-process **wafer** . In addition to being used in fabricating system **chip** sets, ARMS is expected to find immediate use among makers of ASICs, where manufacturing of complex, multi-level devices in small production runs places a...

6/3,K/16 (Item 4 from file: 636)
DIALOG(R)File 636:Gale Group Newsletter DB(TM)
(c) 2003 The Gale Group. All rts. reserv.

01050987 Supplier Number: 40557668 (USE FORMAT 7 FOR FULLTEXT)
DU PONT TO PRODUCE PHOTOMASKS IN KOREA
New Materials Korea, v2, n2, pN/A

Nov, 1988
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 251

... rise to $25 million a year by 1990. At present there are two mask shops operating: one is the in-house mask shop of Samsung **Semiconductor** and Telecommunications Co Ltd; the other is in the state-funded Electronics and Telecommunications Institute but this does not have large scale production facilities.

Table 2: **Photomask** demand in Korea (in $ million)

Company	1988	1990	1991
Samsung **Semiconductor** & Telecommunications	8	10	11
Goldstar **Semiconductor**	4	6	7
Hyundai Electronics	2.5	3.5	4.5
Daewoo Telecommunications	1	1.8	2.5
Korea Electronics	1	2	2
Others	0.5	2	2.5
Totals	17	25.3	29.5

Demand among the various Korean **semiconductor** manufacturers is given in Table 2.

6/3,K/17 (Item 1 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

05346418 Supplier Number: 48132849
Align-Rite International, Inc. - Company Report
Investext, p1-9
Nov 19, 1997
Language: English Record Type: Abstract
Document Type: Magazine/Journal; Trade

ABSTRACT:
...of photomasks in the United States and Europe with little exposure to Southeast Asia and to DRAM manufacturers and a disproportionately high exposure to custom **IC** product manufacturers. Aligh-Rite's strategy is to focus on the profitable mainstream photomask applications. The company is benefiting from the growth in photomask demand and continued outsourcing and consolidation in the **photomask** business.x0D **Tables** in report: Stock Price, Earnings Data And Rating 1996-98; Selected Balance Sheet Items; Notes To Companies Mentioned; Sales And Earnings Model 1996-99; Balance...

6/3,K/18 (Item 2 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

05040764 Supplier Number: 47400046
LG Semicon/Samsung Electronics - Company Report
Investext, p1-46
May 20, 1997
Language: English Record Type: Abstract
Document Type: Magazine/Journal; Trade

ABSTRACT:
...orders & contracts, quarterly/interim results, sales/earnings,

securities transactions & ownership, valuation, and provides investment recommendation and stock price data. Products and services cited include memory **circuits** , **semiconductors** , microprocessors, **semiconductor** manufacturing equipment, cellular radio systems, silicon **wafers** , integrated **circuits** , chemical vapor deposition equipment, **photomasks** , photoresists, and microcontrollers.x0D **Tables** in report: Tab 1 Global Technology Shareprice Performance Data 1996-97; Global Technology Stock Comparison 1996-98E; **Semiconductor** Industry Ranking 1995-96; Korea's **Semiconductor** Export, 1996; LG And Samsung Fabs 1993-98; Strategic Alliances; Korea's **Semiconductor** Industry Revenue Trend 1995-98; Samsung Electroncis Stock Price/Earnings Data 1996-98; Samsung Electroncis Earnings Model, 1994A-1998e; Samsung Electroncis Balance Sheet, 1992A-1996a...

6/3,K/19 (Item 3 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

03284961 Supplier Number: 44530265 (USE FORMAT 7 FOR FULLTEXT)
Submicron Expense Vexes Industry
Electronic News (1991), p1
March 21, 1994
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 1140

... DRAM lithography, Peter Silverman of Intel said, 'We view cost of ownership as key to driving down the cost of process technology.' Like many other **chip** makers, Intel is employing cost-of-ownership models in designing and equipping its fabs, he added.
The time necessary in getting a fab built, equipped...

...said. 'Cutting a month off (the schedule) is critical.'
John G. Skinner of Du Pont Photomasks noted there are several key cost factors in producing **photomasks** and **reticles** today: larger **databases** required for optical proximity correction (OPC); longer mask-writing times to account for OPC; limited tool availability; more measurements; and higher **substrate** costs.
Cost reductions can be achieved through a number of ways, he suggested, such as minimizing mask levels through tighter specifications, optimizing mask job organization...

6/3,K/20 (Item 4 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

02701828 Supplier Number: 43608931 (USE FORMAT 7 FOR FULLTEXT)
Arms reach out to speed processing
Electronics Times, p15
Jan 28, 1993
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 294

... ability to have three pods mounted at any one time.
In 20s, Arms can remove the exposed photomask, load the next mask on to the **reticle** **table** and perform a complete through-the-lens alignment to the in-process **wafer** . ASML measures the changeover period from the time of the last exposure of the first mask to the first possible exposure of the next.
The...

...with the reticle exchange to prevent contamination, caused by friction during the changeover, affecting yield. The 5500 steppers also have a laminar airflow over the **wafer** , which helps to protect against contamination.
The reticle exchange will allow **wafers** to be processed with more

than one **chip** design on each. This should help **asic** companies by reducing minimum batch size without adding to costs.
ASML also believes the Arms equipment will allow system chip sets to be processed on...

6/3,K/21 (Item 5 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

02350597 Supplier Number: 43083525
Tokyo Ohka Kogyo - Company Report
Investext, p1-3
June 17, 1992
Language: English Record Type: Abstract
Document Type: Magazine/Journal; Trade

ABSTRACT:
KANKAKU SECURITIES CO., LTD. report by Anon
Amid the slump in the **semiconductor** industry, the company, which holds a 70% share of the market for photoresists, suffered a 5.2% decline in recurring profits last term. However, this...

...bottom, and recurring profits are forecast to inch up 1.7% in the current term. On the basis of its strong foothold in photoresists for **semiconductors** , the company has aggressively advanced into the market for photoresists for LCs. It has completed a mass-production setup, and the new operations are very...

...integration, competition in the resist industry has grown fierce, but the company's lead in the market is virtually unshakable. Products and services cited include **photomasks** .
Tables in report: Stock Price & Earnings Data 1993; March Term Sales & Profit Data 1989-94; March Term Sales By Segment 1991-93
The INVESTEXT database offers...

6/3,K/22 (Item 6 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

01722591 Supplier Number: 42151684
Hoya - Company Reportt
Investext, p1-3
June 14, 1991
Language: English Record Type: Abstract
Document Type: Magazine/Journal; Trade

ABSTRACT:
...base. With the switchover to 4M DRAMs the demand for mask blanks and photo masks is set to pick up while the steady growth of **ASIC** business is expected to continue. Hoya has also been investing in new facilities in order to increase the value added by selling more **photo masks** rather than the blanks.
Tables in report: Equity-Linked Bonds 1989; Market Data; Parent And Consolidated Sales & Earnings Data 1988-93; Sales And Earnings Data 1990-93; Sales Breakdown By...

6/3,K/23 (Item 7 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

01644649 Supplier Number: 42034972 (USE FORMAT 7 FOR FULLTEXT)
Offers Wafer, Reticle Transport Unit
Electronic News (1991), p19
April 29, 1991
Language: English Record Type: Fulltext

Document Type: Magazine/Journal; Trade
Word Count: 325

... within the fab by the monorails; upon arrival, they are stored in a stocker.

Other intra-bay robots can then be used to move the **wafers** into process stations. When the process is completed, the **wafer** cassette can be returned to the stocker and sent along to the next bay.

In addition to providing hands-off transport of **wafers** , the package can identify **wafers** or lots and track material location. Reticles for **wafer** steppers can also be transported.

PRI builds the model 7300 mini-stocker, which can provide a buffer for a single bay or workcell, and the 7500 stocker, with five times the storage space. The 7500 can also be extended to serve as a central large-capacity **repository** . For **reticle** storage and retrieval, the 7700 reticle management system is used.

Wafer handling within a process bay is performed by PRI's floor-mounted RoboTrack cassettes from the local stocker and moves them to process equipment, **wafer** transfer stations or test stations.

ProgramMation's ProgrammaTrack monorail uses small battery-powered cars, equipped with microprocessors, to carry material. The transport lines are usually attached to walls or ceilings, and are controlled by a central host computer. Cars can be configured to hold **wafer** cassettes, cassette boxes, SMIF pods or reticle boxes.

A PRI spokeswoman said several orders had already been received for the system, which is available immediately...

6/3,K/24 (Item 8 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

01220419 Supplier Number: 41407349
KLA Instruments - Company Report
Investext, p1-7
June 27, 1990
Language: English Record Type: Abstract
Document Type: Magazine/Journal; Trade

ABSTRACT:
SMITH BARNEY, HARRIS UPHAM & CO., INC. report by Stern, R.
Argues that KLA Instruments was an innovator in automated optical inspection (AOI) and targeted the **semiconductor** industry for its initial applications. In 1986, the company diversified by announcing an inspection system for printed **circuit** boards. Discusses the impact on the company of the fragmented AOI industry, with its many niches and many competitors. The company has been dominant in **reticle** inspection.
Tables in report: Stock Price Data 1989-91; Income Statements 1983-93; Balance Sheets 1983-93; Consol. Cash Flow Statements 1983-93; Qtly./Full Year Income...

6/3,K/25 (Item 1 from file: 160)
DIALOG(R)File 160:Gale Group PROMT(R)

00948295
Western Digital and Texas Instruments agreed to second-source various MOS/LSI peripheral ICs from each other's product lines.
Digital Design July, 1983 p. 10

... and WD 1935 communications controllers, WD 2501 and WD2511 .25 communications controllers, and the WD1510 first-in first-out (FIFO) buffer and WD1511 FIFO support **chip** . The 2 companies will transfer product **data bases** to generate **photomasks** and test vectors.
...

6/3,K/26 (Item 2 from file: 160)
DIALOG(R)File 160:Gale Group PROMT(R)

00936223
Texas Instruments has signed a microprocessor peripherals 2nd source agreement with Western Digital.
Electronic News May 9, 1983 p. 51

The agreement includes a transfer of the product **data bases** needed to generate **photomasks** and test vectors. Western Digital will offer 3 TI video display processors, a multiprocessor interface device, and a general-purpose interface-bus, while TI will offer 4 Western Digital communications controllers, a FIFO buffer, and a FIFO support **circuit** .

6/3,K/27 (Item 3 from file: 160)
DIALOG(R)File 160:Gale Group PROMT(R)

00494760
A computerized laser scribing system for making silicon and ceramic IC masters has been developed by Western Electric's Allentown Works (Pennsylvania).
Bell Laboratories Record August, 1979 p. 92-198

The Laser Reticle Generator, designed to upgrade **IC** mask production while retaining compatibility with standard Bell Labs formats, reads coded specifications off magnetic computer tape to monitor and direct the machining laser beam constantly. The target **reticle** moves on a reciprocating **table** , while a computer-controlled external modulator deflects or focuses the laser beam, depending on instructions. ...

6/3,K/28 (Item 1 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

10576907 SUPPLIER NUMBER: 21243713 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Nine-inch reticles: an analysis. (part 1)
Singh, Rajeev R.; Vu, Sonny; Souza, John R.
Solid State Technology, v41, n10, p83(4)
Oct, 1998
ISSN: 0038-111X LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 2168 LINE COUNT: 00176

... available field size on a 6-in. reticle after 4:1 reduction is 35 x 35 mm (i.e., 140 x 140 mm on the **reticle**). (TABULAR DATA FOR **TABLE** 1 OMITTED) Therefore, if field size requirements grow as predicted by the Roadmap, the 9-in. reticle would need to be inserted into production at...

...as long as die-size growth is not being restricted.

The Roadmap shows die-size requirements for dynamic random access memory (DRAM) and microprocessor (MPU) **chip** generations with shrinks occurring each year after production for a given node starts. As volumes are not expected to be significant in the first year...investment,

* development costs,
* raw materials, labor, and processing costs, and
* cost allocation based on total mask demand, which is driven by mask utilization (i.e., **wafers** exposed/mask) and total **wafer** demand.

We obtained data on the utilization of reticles from two industry sources that agreed closely (Table 3).

The average number for **wafers** /reticle is fairly low, which we believe can be attributed to the frequency of product changes and the number of redesigns in a product life cycle.

Table 3. **Reticle** utilization from two references

	Reference (2)	Reference (3)

Average **wafers** /reticle	1800	2500
Median **wafers** /reticle	226	240
Best case **wafers** /reticle	25,000	25,000-30,000

In our analysis, we used 4500, 7000, and 9000 **wafers** /mask. This range of mask utilization represents cases more favorable to 9-in. reticle economics and were chosen based on internal considerations. We used a wide range of **wafer** start levels to determine 9-in. retire demand: 2000, 8000, and 24,000 **wafer** starts/week.

We analyzed the impact of direct costs by using only the incremental cost of making 9-in. reticles compared to 6 in. In...

6/3,K/29 (Item 2 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

10507393 SUPPLIER NUMBER: 21188542 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Mask technology challenges and 230-mm reticles.
Grenon, Brian J.
Solid State Technology, v41, n8, p46(3)
August, 1998
ISSN: 0038-111X LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 1489 LINE COUNT: 00132

... which, for the most part, happened by default. At that time, most of the mask fabrication equipment was capable of handling both sizes of mask **substrates** . When users were ready for the next size reticles, no large capital expenditures were required. Additionally, the 152-mm mask was easy for manufacturing personnel...

...5 2 - -

Mask specifications	3	2	1	-	2
Mask lithography	3	-	-	-	-
New resists	-	-	4	1	-
Defect inspection	-	-	-	3	2
Mask repair	-	-	1	2	-
230-mm **reticles**	-	-	-	-	-1

* Respondents **listed** one or more priorities, in order of importance.

The challenges and costs associated with the upgrade of a mask fabrication facility to 230-mm reticle...

...when a company must account for writing errors and other mishaps. These costs would also be difficult to recover because of the low number of **wafer** runs / mask set, which is projected on the average of 2000.

Survey respondents were asked their top priorities relating to mask technology development. Surprisingly, only one respondent felt that production of 230-mm **reticles** was the highest priority. **Table** 1 shows the relative priority of the mask technology challenges facing the industry. Not all respondents provided more than one priority. (Some provided five priorities...

...that 230-mm reticle development is currently a low priority.

Participants were also asked what areas would limit their ability to fully integrate 230-mm **reticle** production. **Table** 2 is a summary of their responses. The number one priority is what the participants considered the biggest technology limiter to fully integrating a 230...
...preponderance of opinion is that mask lithography (pattern generation) will be the major technical challenge, followed by the ability to obtain quality 230-mm quartz **substrates** . A closer review of Table 2, however does indicate that all of the sectors of the mask fabrication process are of some concern.

Table 2...

...remain, and 230 mm will ultimately have to happen. The only way to completely eliminate the need for reticles is to go to direct write.

Chip size will drive this movement. Survey participants were also asked what was the primary factor driving the need for 230-mm **reticles**. **Table** 3 shows the responses, and that there will be no one specific reason for lithographers to introduce the larger reticles. Historically, the argument has been that higher productivity could be achieved through use of multichip reticles; however, larger **chip** sizes will start to have an impact on the decision process.

Table 3. What drives your need to build 230-mm reticles?

Reason	# of responses
300-mm **wafer** production3	
Die size	5
Multichip reticles	6

Participants were also asked when they would be able to write 230-mm reticles and when their respective...

6/3,K/30 (Item 3 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
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06723739 SUPPLIER NUMBER: 14535439 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Device yield and reliability by specification of mask defects. (semiconductors)
Wiley, James N.; Reynolds, James A.
Solid State Technology, v36, n7, p65(6)
July, 1993
ISSN: 0038-111X LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
WORD COUNT: 3408 LINE COUNT: 00280

... 0.35-||micro
meter
design rule.
TABULAR DATA OMITTED
These safe maximum allowable defect sizes are compared with conventional defect size specifications in Table 5.

Table 5. Comparison of conventional **reticle** defect specifications with those derived from defect/CD interactions

DRAM generation	Feature size on **wafer**	Conventional reticle defect size	Safe reticle defect size
1 Mbit	0.8	1.5	0.45
4 Mbit	0.6	1.0	0.34
16 Mbit	0.5	0...	

...areas of a reticle and processes the information to determine potential defect sites. This is the technique of choice and is generally used when the **reticle** contains repeating information.

Die-to- **database** inspection compares the optical image of the **wafer** with the digital information that was used to generate the mask. This method is used when a reticle contains only a single die. Because it...

6/3,K/31 (Item 4 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
(c)2003 The Gale Group. All rts. reserv.

03141559 SUPPLIER NUMBER: 04595258 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Micro Mask Inc. receives contract from Sandia Laboratories to provide $2 million of photomasks.
PR Newswire, LA8
Jan 8, 1987
LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
WORD COUNT: 352 LINE COUNT: 00029

... lithography and inspection areas currently is being evaluated as the second phase of the program.

Ross noted that despite prevailing soft market conditions in the **semiconductor** industry, the company's photomask division has achieved a 21 percent sales growth over the past two years.

"We have increased our volume from key **semiconductor** manufacturers, including AMD, LSI Logic, Intel and Signetics," he said. "As a result, we must have the capacity in place to serve a broad customer...

...and service."

Key equipment included in the expansion is a KLA/Micrion Model 808 focused ion-beam repair system, used to'rlpair submicron defects on **photomasks** ; a KLA 228 die-to- **data base** mask inspection system; and an RC Labs electronic data link allowing customers in remote locations to transmit data tapes electronically. Formerly, the delivery of such tapes added one or two days to the production times, Micro Mask said.

Micro Mask is a high-technology company serving the **semiconductor** and electronics industries. In addition to photomasks, its principal products include photoplates and aluminum memory disks from the EMC division and probe cards and test...

6/3,K/32 (Item 5 from file: 148)

02967563 SUPPLIER NUMBER: 04352965 (USE FORMAT 7 OR 9 FOR FULL TEXT)

MOSFETs are coming on strong. (power switching equipment)

Carlisle, Ben H.
Machine Design, v58, p86(5)
July 24, 1986
ISSN: 0024-9114 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
WORD COUNT: 2258 LINE COUNT: 00177

... that surround the cells. The high-voltage rating results in part from the guard-ring structure.

Photo: An operator at International Rectifier loads power-MOSFET **wafers** onto the planetary structure of an automatic sequential evaporator. Here an electron beam vaporizes metals and deposits the material on the **wafers** in extremely thin layers, an important factor in the production of rugged, low-cost MOSFETs.

Photo: Each of these power MOSFETs are tested to a specified avalanche level by General Electric Co. A resulting ruggedness rating, specified in mJ, guides designers in applying the devices in inductive **circuits** .

Photo: The **photo mask** on a light **table** precisely positions the source structure for high-density power MOSFETs recently developed by RCA Inc. Precise positioning is increasingly important as cell density rises.

?

02212148 Supplier Number: 56905326 (THIS IS THE FULLTEXT)
PRI Automation Announces New Combination Reticle Stocker.
PR Newswire, p9143
Oct 26, 1999
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 920
TEXT:
-- Innovative Product Provides High Capacity Storage with Quick Access for Improved **Reticle Management** --

BILLERICA, Mass., Oct. 26 /PRNewswire/ -- PRI Automation, Inc. (Nasdaq: PRIA), the leader in semiconductor factory automation, today announced availability of the Combination Reticle Stocker. The Combination Reticle Stocker combines high-density, **bare reticle** storage with quick access, reticle box and pod storage to improve stepper utilization and more effectively **manage reticle inventory** .

"Semiconductor manufacturers are looking for ways to improve the productivity of their lithography operations to get a better return on their investment," said Mitch Tyson, president and chief executive officer of PRI Automation. "The Combination Reticle Stocker brings two proven reticle storage methods together into a single system that will increase throughput and make lithography a more productive part of the overall manufacturing process."

"The Combination Reticle Stocker offers customers the benefits of both a **bare reticle** stocker and a box or pod stocker," noted Tom McNabb, vice president of PRI's lithography business unit. "It saves expensive floorspace in the lithography bay by providing the high-density storage environment of a **bare reticle** stocker and the fast access to pre- **kitted reticles** of a pod or box stocker. As a result, fewer stockers and reticle carriers are needed which helps to reduce reticle storage footprint, lower cost, and improve the **management** of **reticle inventory** ."

"Lithography sets the pace for overall factory throughput. Every minute a stepper sits idle because it doesn't have the right reticle is lost revenue opportunity for the manufacturer," continued Tyson. "And too often, wafer lots are left waiting at the lithography tool while an operator looks for the right reticle."

Three key trends are driving manufacturers to look for ways to automate more of the material handling inside the lithography bay. First, the cost of lithography tools, already the most expensive component of semiconductor manufacturing, is going up. Tool manufacturers estimate that next generation 193nm and 157nm critical layer lithography tools could exceed $10 million each. Secondly, device complexity is increasing as manufacturers design smaller feature sizes and more functionality into chips resulting in more lithography steps and more reticles in each complete reticle set. Finally, the cost of reticles is also on the rise. Each 20+ reticle set contains non- critical layer and critical layer reticles. A simple pad mask may cost $2,000, but a critical layer phase shift reticle can cost upwards of $20,000 today and may reach as high as $50,000 for next generation designs. In some cases, this could push the cost of a complete reticle set to over $1,000,000.

PRI is addressing these challenges with a growing set of lithography automation solutions designed to increase the utilization of expensive lithography tools. Today's announcement addresses the critical components of storing and managing the increasing number of reticles that will be required to produce current and next generation chips.

The Combination Reticle Stocker can be configured to store up to 5,000 **bare reticles** and up to 400 reticles stored in industry standard pods or boxes. Less frequently used reticles are archived in the **bare reticle** side of the Combination Reticle Stocker until they are needed for production. A reticle-handling robot on the **bare reticle** side gently places a reticle into a carrier and closes the carrier. Another robot on the pod or box side takes the carrier and moves it to a storage shelf or delivers it to the operator I/O. The pod or box side permits pre-kitting,

ensuring that reticles are available to the operator when required.

The Combination Reticle Stocker integrates with PRI's AeroTrak(TM) overhead monorail system, permitting reticle delivery to the lithography bay from anywhere within the fab. This offers an additional space saving benefit, because reticle stockers no longer need to be located within the lithography bay.

The Combination Reticle Stocker can be integrated with PRI's TransNet(TM) **Reticle Management** System (TRMS) for complete **reticle** lifecycle **management** . The TRMS is a fab-wide, Web-enabled software control system that manages usage, kitting and unkitting, delivery and maintenance of reticles. The TRMS can also integrate configurable business rules for optimized inventory control. For example, fabs can establish rules that require **reticle cleaning** after a defined number of uses. The TRMS tracks the number of times a reticle is used and once the limit number is reached, the TRMS locks out further uses until cleaning is performed. The TRMS can be used standalone with single or multiple stockers, or it can be integrated with fab CIM systems as well as PRI's TransNet MCS.

According to figures released by Dataquest for calendar year 1998, PRI is the leading supplier of automated **reticle management** systems with over 65% market share. PRI has been shipping **reticle management** systems since 1991 and has an installed base of over one hundred systems. The new Combination Reticle Stocker has been installed at several leading semiconductor manufacturers and PRI has orders for additional systems currently in production.

About PRI Automation

PRI Automation, Inc., headquartered in Billerica, Massachusetts, is the leading global supplier of advanced factory automation systems and software that optimize the productivity of semiconductor and precision electronics manufacturers as well as OEM process tool manufacturers. PRI is the only company to provide a tightly integrated and flexible hardware and software solution that optimizes the flow of products, data, materials and resources throughout the production chain. The company has thousands of systems installed at approximately one hundred locations throughout the world. For more information visit PRI online at www.pria.com.

11/3,K/1 (Item 1 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)

02188671 SUPPLIER NUMBER: 20831608 (USE FORMAT 7 OR 9 FOR FULL TEXT)
KLA-Tencor Unveils Tool For Deep-Ultraviolet Use.(the 353UV automated ultraviolet-based reticle inspection system for deep-ultraviolet applications)(Product Announcement)
McGrath, Dylan
Electronic News (1991), v44, n2223, p44(1)
June 15, 1998
DOCUMENT TYPE: Product Announcement ISSN: 1061-9577 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 754 LINE COUNT: 00064

... reduce downtime and make it easier to maintain and manufacture," said Steve Schuda, product marketing **manager** .
Du Pont **Photomasks** , Inc. (DPI), Round Rock, Texas, has already performed preliminary evaluations of the 353UV. "DPI engineers...

...Tencor VP and GM of the Reticle & Photomask Inspection division (Rapid). "KLA-Tencor's new **reticle** inspection system delivers the 150-nanometer sensitivity required to **inspect** the **reticles** used in leading-edge UV and deep-UV lithography.

11/3,K/2 (Item 2 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)

01535008 SUPPLIER NUMBER: 12537134 (USE FORMAT 7 OR 9 FOR FULL TEXT)
KLA builds UV inspector for X-ray printed wafers. (KLA Instruments Corp.; ultra-violet)
Electronic News (1991), v38, n1926, p4(1)
August 24, 1992
ISSN: 1061-6624 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 434 LINE COUNT: 00034

... image processing equipment" found on the KLA 331 inspection system, said Mark Brandemuehl, product marketing **manager** for KLA's **Reticle** & Photomask Inspection division.
Kenneth Levy, KLA chairman and CEO, said DARPA funding allowed it "to ...

...the reticle," said Mr. Brandemuehl. KLA is developing a scanning electron microscope tool which directly **inspects** the **reticle** , he said, but "The question is always: What kinds of defects print, and which do...

11/3,K/3 (Item 3 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)

01520823 SUPPLIER NUMBER: 12345831 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Particles: keeping the killer out; firms plan class 1 (costly) offensive against fine particles. (Preview Issue: Semicon/West)
Dorsch, Jeff
Electronic News (1991), v38, n1915, p26(1)
June 8, 1992
ISSN: 1061-6624 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 1045 LINE COUNT: 00084

... up, and it's not linear," noted Richard Shepherd, who recently served as special projects **manager** for Du Pont **Photomasks** during that company's construction of a class 1 **clean** room for pellicle manufacturing in Danbury, Conn.
As critical as fab construction is becoming in...

11/3,K/4 (Item 4 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)

01520820 SUPPLIER NUMBER: 12345823 (USE FORMAT 7 OR 9 FOR FULL TEXT)
KLA opt system probes 0.2 microns. (KLA Instruments Inc.'s KLA 331 photomask and reticle inspection system) (Preview Issue: Semicon/West)
Holden, Daniel
Electronic News (1991), v38, n1915, p20(2)
June 8, 1992
ISSN: 1061-6624 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 751 LINE COUNT: 00060

... inspection capabilities, as well as sensitivity to 0.10 micron, said Mark Brandemuehl, product development **manager** for KLA's **Reticle** & Photomask Inspection division.
The system, which was in development for more than five years, is...

...at a rate of 50 million pixels per second. The computer detects, displays and identifies **reticle** defects.
The entire system can be **cleanroom** isolated so that all the user sees is a microscope, a keyboard, a mouse and...

...found, the most obvious effect of this selectivity is throughput flexibility. The KLA 331 can **inspect** a 100-millimeter-square **reticle** for 0.20 micron defects in 60 minutes; it can detect 0.40 micron defects...

...faster than previous KLA systems, said the company.
Michael D. McCarver, vice president and general **manager** of the **Reticle** & **Photomask** Inspection division, said the system has been accepted at seven photomask suppliers worldwide, with several...

11/3,K/5 (Item 1 from file: 621)
DIALOG(R)File 621:Gale Group New Prod.Annou.(R)

02212148 Supplier Number: 56905326 (USE FORMAT 7 FOR FULLTEXT)
PRI Automation Announces New Combination Reticle Stocker.
PR Newswire, p9143
Oct 26, 1999
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 920

Quick Access for Improved **Reticle Management** --
BILLERICA, Mass., Oct. 26 /PRNewswire/ -- PRI Automation, Inc. (Nasdaq: PRIA), the leader in semiconductor factory...

...today announced availability of the Combination Reticle Stocker. The Combination Reticle Stocker combines high-density, **bare reticle** storage with quick access, reticle box and pod storage to improve stepper utilization and more effectively **manage reticle inventory** .
"Semiconductor manufacturers are looking for ways to improve the productivity of their lithography operations to...

...the overall manufacturing process."
"The Combination Reticle Stocker offers customers the benefits of both a **bare reticle** stocker and a box or pod stocker," noted Tom McNabb, vice president of PRI's...

...expensive floorspace in the lithography bay by providing the high-density storage environment of a **bare reticle** stocker and the fast access to pre- **kitted reticles** of a pod or box stocker. As a result, fewer stockers and reticle carriers are needed which helps to reduce reticle storage footprint, lower cost, and improve the **management** of **reticle inventory** ."

"Lithography sets the pace for overall factory throughput. Every minute a stepper sits idle because...

...generation chips.
The Combination Reticle Stocker can be configured to store up to 5,000 **bare reticles** and up to 400 reticles stored in industry standard pods or boxes. Less frequently used reticles are archived in the **bare reticle** side of the Combination Reticle Stocker until they are needed for production. A reticle-handling robot on the **bare reticle** side gently places a reticle into a carrier and closes the carrier. Another robot on...

...the lithography bay.
The Combination Reticle Stocker can be integrated with PRI's TransNet(TM) **Reticle Management** System (TRMS) for complete **reticle** lifecycle **management** . The TRMS is a fab-wide, Web-enabled software control system that manages usage, kitting...

...configurable business rules for optimized inventory control. For example, fabs can establish rules that require **reticle cleaning** after a defined number of uses. The TRMS tracks the number of times a reticle...

...figures released by Dataquest for calendar year 1998, PRI is the leading supplier of automated **reticle management** systems with over 65% market share. PRI has been shipping **reticle management** systems since 1991 and has an installed base of over one hundred systems. The new...

11/3,K/6 (Item 2 from file: 621)
DIALOG(R)File 621:Gale Group New Prod.Annou.(R)

01623928 Supplier Number: 48364801 (USE FORMAT 7 FOR FULLTEXT)
KLA-Tencor Extends Reticle **Quality** Management **Through the Photolithography Process.**
Business Wire, p03190293
March 19, 1998
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 592

KLA-Tencor Extends Reticle **Quality** Management **Through the Photolithography Process.**
... the SL3 STARlight (simultaneous transmitted and reflected light) contamination inspection system and the Model 91 **reticle** inspection data **management** server, key contributors to KLA-Tencor's **reticle** quality **management** (RQM) technology. A comprehensive RQM solution can provide consistent photomask contamination inspection for the life...

...particulate matter, transmission errors and electrostatic discharge (ESD) damage, on its chrome surface. Its unpatterned **reticle** surface analysis (URSA) option enables the system to **inspect** all **reticle** surfaces including the pellicle and backside of the **reticle** . This next-generation tool, the successor to the SL300, delivers superior automation, improved ease-of...

11/3,K/7 (Item 3 from file: 621)
DIALOG(R)File 621:Gale Group New Prod.Annou.(R)

01479813 Supplier Number: 47059518 (USE FORMAT 7 FOR FULLTEXT)
TOP SEMICONDUCTOR COMPANIES IMPLEMENT KLA STARLIGHT WITH URSA INSPECTION STRATEGY
News Release, pN/A
Jan 23, 1997
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 379

(USE FORMAT 7 FOR FULLTEXT)
TEXT:
...inspection system is used to detect contamination defects on the patterned chrome surface of a **photomask** . URSA, a product extension for STARlight, **inspects** the pellicles and unpatterned glass surfaces of the **reticle** for contaminants and imperfections. Among the first to receive a STARlight/URSA system will be Rockwell Semiconductor Systems, a division of Rockwell International. "Traditionally, Rockwell would **inspect** incoming **reticles** using two systems - one for the patterned chrome surface and a second for pellicles and backside glass," said Gordon Miller, **manager** of **Photomask** Operations at Rockwell. "Having STARlight with URSA allows us to run one inspection. This will...
...help our customers achieve advancements in technology and productivity," stated Ed Grady, vice president, general **manager** of KLA's **Reticle** and Photomask Inspection Division. KLA Instruments is the world's leading manufacturer of yield management...

11/3,K/8 (Item 1 from file: 636)
DIALOG(R)File 636:Gale Group Newsletter DB(TM)

03475466 Supplier Number: 47168246 (USE FORMAT 7 FOR FULLTEXT)
TESTING AND MEASUREMENT:KLA System Has Inspection Feature
Thin Film/Diamond Technology News, v3, n3, pN/A
March 1, 1997
Language: English Record Type: Fulltext
Document Type: Newsletter; Trade
Word Count: 233

... inspection system is used to detect contamination defects on the patterned chrome surface of a **photomask** . URSA, a product extension for STARlight, **inspects** the pellicles and unpatterned glass surfaces of the **reticles** for contaminants and imperfections.
Among the first to receive a STARlight/URSA system will be Rockwell Semiconductor Systems, a division of Rockwell International. "Traditionally, Rockwell would **inspect** incoming **reticles** using two systems--one for the patterned chrome surface and a second for pellicles and backside glass," says Gordon Miller, **manager** of **Photomask** Operations at Rockwell. "Having STARlight and URSA allows us to run one inspection. This will...

11/3,K/9 (Item 1 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

02335110 Supplier Number: 43060782 (USE FORMAT 7 FOR FULLTEXT)
PARTICLES -- Keeping the Killer Out: Firms Plan Class I (Costly) Offensive Against Fine Particles
Electronic News (1991), p26
June 8, 1992
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 993

... up, and it's not linear," noted Richard Shepherd, who recently served as special projects **manager** for Du Pont **Photomasks** during that company's construction of a class 1 **clean** room for pellicle manufacturing in Danbury, Conn.
As critical as fab construction is becoming in...

11/3,K/10 (Item 2 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

02335083 Supplier Number: 43060755 (USE FORMAT 7 FOR FULLTEXT)
KLA Op System Probes 0.2 Microns
Electronic News (1991), p20
June 8, 1992
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 711

... inspection capabilities, as well as sensitivity to 0.10 micron, said Mark Brandemuehl, product development **manager** for KLA's **Reticle** & Photomask Inspection division.
The system, which was in development for more than five years, is...

...at a rate of 50 million pixels per second. The computer detects, displays and identifies **reticle** defects.
The entire system can be **cleanroom** isolated so that all the user sees is a microscope, a keyboard, a mouse and...

...found, the most obvious effect of this selectivity is throughput flexibility.
The KLA 331 can **inspect** a 100-millimeter-square **reticle** for 0.20 micron defects in 60 minutes; it can detect 0.40 micron defects...

...faster than previous KLA systems, said the company.
Michael D. McCarver, vice president and general **manager** of the **Reticle** & **Photomask** Inspection division, said the system has been accepted at seven photomask suppliers worldwide, with several...

11/3,K/11 (Item 1 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

09652262 SUPPLIER NUMBER: 18933464 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Automated reticle transport and stepper loading.
Lambson, Chuck; Choudhury, Marcel; Davis, Robert
Solid State Technology, v39, n10, p97(5)
Oct, 1996
ISSN: 0038-111X LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 3029 LINE COUNT: 00248

TEXT:
...000 active reticles. Custom fabrication environments often require a reticle change for nearly every lot. **Managing reticle** storage, transportation, and qualification typically consumes the efforts of several employees who are dedicated to reticle handling. In some cases, **reticle management** is relegated to the stepper operators, causing significant distraction from their primary job of maximizing...
Over the last several years, the systems used to **manage** large **reticle inventories** have become increasingly automated. By the end of the 1980s, new fabs were generally investing in ultraclean automated enclosures for stocking reticles. Those automated reticle stockers, sometimes called **reticle management** systems (RMS), provide dual benefits. First, they provide ultraclean "minienvironments" for storing the reticles, thus...

...and handling of reticles.
This article examines a system that accomplishes the total automation of **reticle management** . The new system adds a stepper-loading robot (SLR) adjacent to each stepper, and the...

...in conjunction with two existing automation systems: AeroTrak, an overhead monorail system that transports the **reticles** ; and **reticle** - **management** system (RMS) stockers that store the reticles. The integrated system, dubbed ARTI (automated reticle transport...

...following performance categories:
* Cleanliness of storage and transport: The entire system must be

Class 1 **cleanroom** compatible.
* Prevention of ESD (electro-static discharge) events: Since **reticles** contain small metal features patterned onto insulating quartz plates, they are easily damaged by ESD...

...systems are mature products with a proven track record for reliable storage and transport of **reticles** and wafers.
The AeroTrak was designed to be a very **clean** method of transporting materials within a fabrication area. During transport, the reticles travel just below...like the I/O of the steppers in the target fab.
Test results for prototype **reticle - management** system
Test description Results
1000 continuous cyclers No fails or assists
to and from stepper...

11/3,K/12 (Item 2 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
(c)2003 The Gale Group. All rts. reserv.

07707851 SUPPLIER NUMBER: 16641906 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Elusive mask defects: the false defect. (photomasks)
Reynolds, James A.
Solid State Technology, v38, n2, p81(2)
Feb, 1995
ISSN: 0038-111X LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
WORD COUNT: 800 LINE COUNT: 00062

... below the allowable minimum feature size, large numbers of false defects will occur when the **reticle** is **inspected** .
The next step is the automatic scanning of the plate. This produces a pixel-by...

...violate the minimum feature size specification of the inspection system that will be used to **inspect** the **reticle** [2].
Solution
Preventing this problem requires that mask users be cognizant of the mask inspection...

...Kirkish, "Meeting the Challenge of Advanced Lithography Reticle Inspection," Proc. BACUS 14th Annual Symp. on **Photomask** Technology and **Management** , p. 7 (Sept. 1994).
2. C. Spence et al., "Optical Proximity Photomask Manufacturing Issues," Proc...

11/3,K/13 (Item 1 from file: 810)
DIALOG(R)File 810:Business Wire
(c) 1999 Business Wire . All rts. reserv.

0604555 BW0070

KLA INSTRUMENTS: KLA And SEMATECH Announce Joint Development of DUV Photomask Inspection System

July 17, 1996

Byline: Business Editors

...and SEMATECH have entered into a joint development agreement to create the next generation of **photomask** inspection systems. These systems will **inspect** advanced **photomasks** by illuminating them with deep ultraviolet (DUV) light. The inspection systems developed will support emerging...

...the industry's efforts to develop the 0.18 micron generation."
Gil Shelden, SEMATECH's **Manager** for **Photomask** Development stated

- that "KLA was selected for their technical strength and their innovative approach to...

09652262 SUPPLIER NUMBER: 18933464 (THIS IS THE FULL TEXT)

Automated reticle transport and stepper loading.

Lambson, Chuck; Choudhury, Marcel; Davis, Robert

Solid State Technology, v39, n10, p97(5)
Oct, 1996
ISSN: 0038-111X .LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 3029 LINE COUNT: 00248

TEXT:

Wafer fabs that have diverse or customized product lines often manage inventories of more than 10,000 active reticles. Custom fabrication environments often require a reticle change for nearly every lot. Managing reticle storage, transportation, and qualification typically consumes the efforts of several employees who are dedicated to reticle handling. In some cases, **reticle management** is relegated to the stepper operators, causing significant distraction from their primary job of maximizing stepper productivity.

Over the last several years, the systems used to manage large reticle inventories have become increasingly automated. By the end of the 1980s, new fabs were generally investing in ultraclean automated enclosures for stocking reticles. Those automated reticle stockers, sometimes called **reticle management** systems (RMS), provide dual benefits. First, they provide ultraclean "minienvironments" for storing the reticles, thus reducing repeating defects and a need for manual quality control. Second, an on-board database allows rapid automatic retrieval of the desired reticle. Thus, automated reticle stockers have been a significant improvement (in terms of both cleanliness and organization) over previous storage systems consisting of shelves, cabinets, or drawers.

Automated transportation

In addition to using stand-alone automated reticle stockers, some fabs have also automated the transportation of reticles to the stepper operator and back to the stocker after use. That is often accomplished by distributing smaller, point-of-use reticle stockers throughout the bay (each serving a small group of steppers) and then interconnecting the local stockers with an overhead transport system.

Automated transportation of reticles not only eliminates some of the nonvalue-added time spent by operators in finding, fetching, loading, unloading, and returning reticles; it also improves the cleanliness of the manufacturing environment by reducing the personnel headcount in the cleanroom, and thus lessening the disruptions to laminar airflow.

The next logical step toward higher levels of reticle-handling automation was a system that automatically receives the reticles from the transport system and loads them into the stepper, and vice versa. Such a system makes possible total automation of day-to-day management, transportation, and handling of reticles.

This article examines a system that accomplishes the total automation of **reticle management** . The new system adds a stepper-loading robot (SLR) adjacent to each stepper, and the new SLR works in conjunction with two existing automation systems: AeroTrak, an overhead monorail system that transports the reticles; and **reticle - management** system (RMS) stockers that store the reticles. The integrated system, dubbed ARTI (automated reticle transport and insertion), was developed through a partnership between Motorola and PRI Automation, with cooperation from the stepper supplier.

Meeting fab requirements

The first installation of the complete reticle-handling system will be in Motorola's COM1 wafer fabrication area (Phoenix, AZ). That fab manufactures a variety of custom and commodity circuits for communications applications. Consequently, it has a particularly high demand for different reticles. Lot sizes at COM1 are very small; many contain only one or two wafers. Due to the short cycle-time requirements, lots will not be batched together by reticle, and consecutive lots will seldom use the same reticle. For those reasons, the frequency of reticle changes will be unusually high.

Because of the diverse and largely custom products manufactured at the

COM1 fab, thousands of active reticles will be maintained in inventory. Based on the estimated number of reticle changes/hour that will be required at full fab capacity, the purchase specification for the system contains specific requirements for the following performance categories:

* Cleanliness of storage and transport: The entire system must be Class 1 cleanroom compatible.

* Prevention of ESD (electro-static discharge) events: Since reticles contain small metal features patterned onto insulating quartz plates, they are easily damaged by ESD events. The materials and design of the system must allow static charges to be continually dissipated from any surface that comes into contact with reticles.

* Positive identification of material: The reticle cassettes have barcode labels encoded with the name and serial number of each reticle. Whenever a reticle is placed into a stocker or a stepper, either manually or automatically, the barcode of the reticle must be read for positive identification.

* High throughput and short delivery times: If a retire is ordered at the time the lot is started on a linked wafer-handling track, the reticle must arrive at the stepper before the first wafer of the lot. A computer simulation of the complete system was run to ensure that the stringent requirements for throughput and delivery times can be met.

* Expandability and flexibility: These requirements ensure that the system can accommodate additional steppers or stockers, and that it will allow relocation of a stepper or stocker (1).

* Warranted reliability: Targets were established for percentage uptime, mean time between assists, and mean time between failures. Performance to those targets is warranted by the equipment supplier. Because some service nodes can run while others are down, the warranty agreement weights the downtime according to the number of nodes that are out of service during a particular downtime event.

Details of the system

A layout and schematic of the integrated system is shown in Fig. 1. The AeroTrak consists of a monorail system suspended from the fab ceiling. Battery-powered vehicles transport the reticles along the monorail track. Turntables at junctions of the AeroTrak allow vehicles to be routed and rerouted. The self-powered, intelligent vehicles automatically park and can recharge their battery packs while idle.

When reticles are ordered by the stepper-cell controller, they are automatically retrieved and placed onto a vehicle by the RMS stocker. The RMS and AeroTrak systems are mature products with a proven track record for reliable storage and transport of reticles and wafers.

The AeroTrak was designed to be a very clean method of transporting materials within a fabrication area. During transport, the reticles travel just below the ULPA filters of the fab ceiling and above the particle generators (such as people and machines) in the fab. The AeroTrak system has been thoroughly tested for particle generation, and meets the requirements for Class 1 cleanrooms.

In addition to low particle generation, the AeroTrak system is designed to control ESD. As reticles move through the air, static charges are imparted to the plastic reticle boxes. To prevent charges from building to the point where an ESD event might cause damage, the AeroTrak is grounded, and the track and vehicles are constructed from conductive materials.

The AeroTrak is designed to be expandable and flexible. If steppers are added to the fab or moved from one location to another, the AeroTrak layout can be expanded or modified to accommodate the changes. Since the monorail track is above the level of people and process equipment, it requires virtually no floor space. Only the stockers and SLRs occupy floor space.

PRI reticle stockers are also designed for very low particle generation and for ESD control. Tests have shown that the stocker environment exceeds Class 1 standards. Like the AeroTrak, stockers are constructed of materials that conduct static charges to ground. Also, the system's stockers can have (as an optional feature) ionized air jets at the manual input/output ports to help dissipate any charges on boxes that are placed in the ports from external sources.

Reticle stockers should have accurate **databases** of the **reticles** stored within them. When a reticle is ordered for a stepper, the database

is queried before confirming or denying the request. To ensure the integrity of stocker **databases** , the **reticle** stockers are each equipped with an optional barcode reader. Each time a reticle is placed into the stocker, from either the manual I/O port or from the AeroTrak automation port, the reticle is presented to the barcode reader before being stored. Each reticle barcode contains a checksum character at the end of the string to ensure that misreads are not stored in the database. Thus the barcode system ensures that the **reticle** stocker always maintains an accurate **database** of its contents. That database, in turn, protects against lost or misdirected reticles.

The only new hardware component of the system is the SLR. One SLR stands adjacent to each stepper and extends above the top of the stepper (ILLUSTRATION FOR FIGURE 2 OMITTED). When the AeroTrak delivers a reticle to a stepper, the vehicle stops above the stepper (directly adjacent to the SLR). The SLR removes the reticle from the vehicle, retracts, then lowers the reticle into the shell of the SLR. The reticle may then either be stored in one of ten internal locations (until the stepper is ready to receive it), or transferred directly into the input port of the stepper.

When the stepper has finished using a reticle, it will place the reticle at the output port of the stepper. Then the SLR will retrieve the reticle and place it onto an AeroTrak vehicle to be transported back to an RMS stocker for storage. For flexibility, both the stepper and the reticle stocker are equipped with manual ports so that the automation capability may be bypassed.

Construction of the SLR allows clean air to flow in from the top and escape through the bottom. Materials used for the SLR will allow static charges to be conducted to ground. Those features will be operationally tested after the SLR is installed in Motorola's COM1 cleanroom.

Building on a foundation

Though the SLR is a new addition to PRI Automation's product line, the robot at the heart of the SLR is an adaptation of an existing robot. Additionally, the software package that controls the movement of reticles and interfaces to the SLR is adapted from software that is currently used for control of wafer transport in many existing production environments. Re-use of those proven components in the design of the new system reduces risks of failure.

The SLR is mounted on rails just below the fab floor and is pinned in position next to the stepper. For maintenance access to the stepper, the SLR can be unpinned and moved on its rails to a position three feet away from the stepper. Communication cables and other connections to the SLR are looped over in the base - when the robot is moved for stepper access, there is no need to disconnect cables or hoses.

To provide for automated reticle loading and unloading, the stepper supplier has made the following modifications to the stepper hardware:

* The optional second reticle magazine has been modified to contain only two slot locations. One of those locations is designated as the input port and the other is designated as the output port.

* The side panel of the stepper, located between the SLR and the optional reticle magazine, has been slotted to allow for SLR access to the I/O ports.

* For reliable control of the SLR-stepper mechanical interface, the SEMI E23 specification for cassette-transfer, parallel-I/O interface has been adhered to by both the SLR and stepper manufacturers (2).

* Additional SECS-II messages have been provided on the stepper interface to facilitate movement of the reticles within the stepper. When the reticle transport system places a reticle at the input port of the stepper, the cell controller will use the stepper SECS-II interface to command reticles away from the input port and to appropriate locations within the stepper. When a stepper is finished with a reticle, the cell controller commands the reticle to the output port.

Software coordinates the system

Communication connections between the software systems that interact to automate reticle delivery are illustrated in Fig. 3. The material-control system (MCS), coordinates the activities of the various retire-handling systems (3).

The MCS server communicates to other systems on the factory local area network (LAN). It communicates to the RMS units, SLRs, and AeroTrak units via a terminal server and RS232 connections. Each stepper interfaces to a

cell controller (4), which orders reticles by sending messages over the factory LAN to the MCS server.

When a lot is started on the wafer-coating track for a particular linked photolithography station, the cell controller receives information from a manufacturing execution system (MES), such as PROMIS or WorkStream, specifying the retire to be used for that lot. The cell controller then sends a request to the MCS to move the required reticle to the appropriate stepper. When a stepper is finished with a retire, the reticle is placed in the output port of the stepper. At that point, the MCS will automatically command the reticle back to a reticle stocker.

In a typical operating scenario, the photocell operator will track-in a wafer lot and place it on the input port of the coater/developer. The cell-controller software will not allow the lot to be tracked in if it cannot determine that the required retire either resides in the stepper or is available on the automation system.

After successful track-in, the cell controller will start the lot on the coater and send a message to the MCS requesting that the reticle be moved to the stepper. The retire will be retrieved from the RMS and placed on the next available vehicle. The AeroTrak delivers the reticle to the stepper, where the SLR will move it from the vehicle to the input port of the stepper. If the stepper is not ready to receive the reticle when it arrives (or if it arrives at the stepper sooner than a previously ordered reticle), the SLR will store the reticle in a temporary location within the SLR and hand it to the stepper later. After the stepper has used the reticle for the lot (and if it is not required for a subsequent lot), the reticle will be returned to the output port of the stepper under the direction of the cell controller. The MCS will then route the reticle back to its home stocker location.

System test results

At this point in the project, a test loop has been built at the supplier's facility, where it has completed burn-in and acceptance testing. The test loop consists of an RMS placed at one end of an AeroTrak loop and an SLR placed at the other end. Adjacent to the SLR is a mockup of a stepper. The stepper mockup contains an actual spare reticle magazine exactly like the I/O of the steppers in the target fab.

Test results for prototype **reticle - management** system

Test description	Results
1000 continuous cyclers to and from stepper	No fails or assists (i.e. 100% up-time)
Actual throughput compared to simulation	Simulated: 35 cycles/hour Actual: 44.18 cycles/hour
Cycle time from order to receipt of reticle Actual: 1.4 min (mean + 2(Sigma))	Simulated: 1.7 min (mean + 2(Sigma))

Burn-in testing of key components was done prior to assembling the entire system. After assembly and integration of the test loop a number of reliability tests were performed. The results of some of those tests are listed in the **table** .

A cycle starts when a **reticle** is ordered for a stepper. The cycle continues through the transport of the reticle to the input port of the stepper, removal from the stepper, and transport back to the stocker. It ends when the reticle is back in a stocker location.

The above tests were performed in a controlled environment at the supplier's manufacturing facility. Tests will be repeated after installation at the customer's site as a part of the final acceptance procedure. In addition to those tests, numerous anomaly tests were conducted at the source inspection and will be repeated at the final acceptance. Because they are quite numerous, the anomaly tests will not be detailed in this article; they were designed to test flexibility, robustness, and error-recovery capability.

After installation at the customer's site, the system will be checked for reliability, and metrics will be reported on a monthly basis. Any failures will be analyzed, and action plans will be jointly developed for continuous improvement of system reliability.

Conclusion

The final component required for total automation of reticle movement in a wafer fabrication area, the stepper loading robot (SLR), has been

designed and built. It has already passed burn-in testing as part of an integrated test loop. Results of the tests have met or exceeded the original objectives of the design. The automated reticle transport and insertion system will next be installed in Motorola's COM1 fab, where it will be tested in a production environment.

References

1. A. Weber, "What managers should know about their manufacturing systems," Semiconductor Fabtech, No. 3 (1995).

2. "Specification for cassette transfer parallel I/O interface," SEMI E23-91, SEMI 1991, 1994.

3. M. Weiss, "Semiconductor factory automation," Solid State Technology, p. 89, January 1996.

4. A. Englisch, A. Deuter, "Automated lithocell," SPIE, vol. 1261, 1990.

CHUCK LAMBSON received his BS degree in chemical engineering from the University of Utah in 1983. He is a staff lithography engineer with Motorola, and is currently assigned to the COM1 fab in Phoenix, AZ, where he is the project manager for photo automation. He has worked in the semiconductor industry for 13 years, specializing in photolithography engineering and production management.

MARCEL CHOUDHURY received his BS and MS degrees in mechanical engineering from North Carolina State University in 1985 and the Georgia Institute of Technology in 1988, respectively. He is presently a senior equipment engineer at Motorola's COM1 wafer-fabrication facility. He previously worked as a factory-automation engineer at Mitsubishi Semiconductor America's DRAM facility.

ROBERT DAVIS received his BSME from the University of Connecticut and an MBA from the University of Massachusetts. He is product manager for lithography systems automation at PRI Automation. Formerly, he was a senior member of the technical staff at GCA Corp.

14/3,K/1 (Item 1 from file: 621)
DIALOG(R)File 621:Gale Group New Prod.Annou.(R)

01675671 Supplier Number: 50161272 (USE FORMAT 7 FOR FULLTEXT)
New Productivity Enhancement Software and Engineering Services Offered to IC Makers at Pay-For-Results Pricing.
Business Wire, p07130401
July 13, 1998
Language: English Record Type: Fulltext
Article Type: Article
Document Type: Newswire; Trade
Word Count: 1042

Spare Parts Inventory, Cost of Ownership and **Reticle Management** Software Packages Reduce Costs for Wafer Fabs Without Bottom-Line Risk During IC Industry Downturn...

...three newest products -- its Spare Parts Inventory Model (SPIM(TM)), Cost of Ownership (COO), and **Reticle Management** System (RMS) tools -- in the third quarter of this year.
TEFEN is offering the new...

...chart that depicts frequency of use in the facility over the equipment's life cycle.
Reticle Management System
TEFEN's third new product, its **Reticle Management** System, is the first software tool to help IC makers cut costs by automating the...

...the production line are the appropriate lots for the current work in progress.
TEFEN's **reticle management** software is a decision-support tool for the lithography system operator on the wafer fabrication...

...of reticles to steppers. The linear programming module then presents to the operator a computerized **list** of instructions for each **reticle** transaction in priority order.
"Simply stated, our **Reticle Management** System puts the right reticle at the right machine at the right time to maximize...

14/3,K/2 (Item 1 from file: 636)
DIALOG(R)File 636:Gale Group Newsletter DB(TM)

02053050 Supplier Number: 43746770 (USE FORMAT 7 FOR FULLTEXT)
PRODUCTION TECHNOLOGY - ASML ADVANCED RETICLE - MANAGEMENT **SYSTEM**
Integrated Circuits International, pN/A
April, 1993
Language: English Record Type: Fulltext
Document Type: Newsletter; Trade
Word Count: 205

(USE FORMAT 7 FOR FULLTEXT)
PRODUCTION TECHNOLOGY - ASML ADVANCED RETICLE - MANAGEMENT **SYSTEM**
TEXT:
...patterns on a single wafer without a significant reduction in throughput. ASML's new Advanced **Reticle Management** System (ARMS), compatible with any PAS 5500 stepper, cuts in half the time required to...

...the next. In that time, ARMS quickly removes the previously exposed photomask, loads the next **photomask** onto the **reticle table** , and performs a complete through-the-lens alignment to the in-process wafer. In addition...

14/3,K/3 (Item 1 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

08753899 Supplier Number: 75917042 (USE FORMAT 7 FOR FULLTEXT)
Automated Reticle Delivery in a 300 mm Fab.(fabrication plant)(Statistical Data Included)
Johnson, Carl
Semiconductor International, v24, n6, p99
June, 2001
Language: English Record Type: Fulltext
Article Type: Statistical Data Included
Document Type: Magazine/Journal; Trade
Word Count: 3127

... systems.
* Automated transport system.
* Automation-compatible process tools.
* Automation-compatible reticle carriers.
* Software systems (including **reticle management** , scheduling and transport control).

These subsystems must work together as an integrated system. To enable...seems simple, but requires a great deal of information and planning. The goals of the **reticle management** system are:
* Manage systemwide reticle storage and status.
* Manage reticle move logistics.
* Efficiently meet the...

...proposed CIM architecture with the components required to implement a solution.

To accomplish the required **reticle management** , four major software systems must be integrated. These systems are described below.

Scheduling System: Provides information to the **reticle management** system on the specific reticle required, the tool at which it is required, and when...

...information to the scheduler on the reticle required for a specific lot and process step.

Reticle Management System (RMS): This system maintains a **database** of all **reticles** in the fab universe, including all the reticles in exposure tools, stockers and inspection areas, as well as those that are at mask shops for cleaning. Data maintained in this **database** includes **reticle** identification, location, number of times a reticle has been used, status, cleaning and inspection intervals...are to be used should only be made at one point to avoid conflicting decisions.

Reticle management system

The RMS tracks all information that is specific to the state of the reticles...

...length of time a reticle has not been used. It is, therefore, proposed that the **reticle management** system provide the logistics for empty carrier management because the system has all the relevant...

...and corresponding reticles could be generated covering a period of time into the future. This **list** would include the lot/ **reticle** ID, tool ID, start time and stop time. This list could be furnished to the...

...Scheduling is a critical function in obtaining tool utilization gains. As we stated earlier, the **reticle management** system must know, in advance, what reticles are required so that the transport system has...

14/3,K/4 (Item 2 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

02701828 Supplier Number: 43608931 (USE FORMAT 7 FOR FULLTEXT)
Arms reach out to speed processing
Electronics Times, p15
Jan 28, 1993

Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 294

... a number of different circuits on the same wafer without reducing throughput.
ASML's Advanced **Reticle Management** System (Arms) consists of two robotic arms used to move reticles mounted in smif pods...

...In 20s, Arms can remove the exposed photomask, load the next mask on to the **reticle table** and perform a complete through-the-lens alignment to the in-process wafer. ASML measures...

14/3,K/5 (Item 3 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

01644649 Supplier Number: 42034972 (USE FORMAT 7 FOR FULLTEXT)
Offers Wafer, Reticle Transport Unit
Electronic News (1991), p19
April 29, 1991
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 325

... storage space. The 7500 can also be extended to serve as a central large-capacity **repository** . For **reticle** storage and retrieval, the 7700 **reticle management** system is used.
Wafer handling within a process bay is performed by PRI's floor...

14/3,K/6 (Item 1 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

09652262 SUPPLIER NUMBER: 18933464 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Automated reticle transport and stepper loading.
Lambson, Chuck; Choudhury, Marcel; Davis, Robert
Solid State Technology, v39, n10, p97(5)
Oct, 1996
ISSN: 0038-111X LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 3029 LINE COUNT: 00248

TEXT:
...consumes the efforts of several employees who are dedicated to reticle handling. In some cases, **reticle management** is relegated to the stepper operators, causing significant distraction from their primary job of maximizing...
... generally investing in ultraclean automated enclosures for stocking reticles. Those automated reticle stockers, sometimes called **reticle management** systems (RMS), provide dual benefits. First, they provide ultraclean "minienvironments" for storing the reticles, thus...

...and handling of reticles.
This article examines a system that accomplishes the total automation of **reticle management** . The new system adds a stepper-loading robot (SLR) adjacent to each stepper, and the...

...with two existing automation systems: AeroTrak, an overhead monorail system that transports the reticles; and **reticle - management** system (RMS) stockers that store the reticles. The integrated system, dubbed ARTI (automated reticle transport...help dissipate any charges on boxes that are placed in the ports from external sources.
Reticle stockers should have accurate **databases** of the **reticles** stored within them. When a reticle is ordered for a stepper, the database is queried before confirming or denying the request. To ensure the integrity of stocker **databases** , the **reticle** stockers are each equipped

with an optional barcode reader. Each time a reticle is placed...

...that misreads are not stored in the database. Thus the barcode system ensures that the **reticle** stocker always maintains an accurate **database** of its contents. That database, in turn, protects against lost or misdirected reticles.

The only...like the I/O of the steppers in the target fab.

Test results for prototype **reticle - management** system

Test description	Results
1000 continuous cyclers to and from stepper...	No fails or assists

...reliability tests were performed. The results of some of those tests are listed in the **table** .

A cycle starts when a **reticle** is ordered for a stepper. The cycle continues through the transport of the reticle to...

```
File   8:Ei Compendex(R) 1970-2003/Jul W2
         (c) 2003 Elsevier Eng.  Info. Inc.
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File  34:SciSearch(R) Cited Ref Sci 1990-2003/Jul W3
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         (c) 2003 The HW Wilson Co.
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         (c) 2003 FIZ TECHNIK
File 438:Library Lit. & Info. Science 1984-2003/Jun
         (c) 2003 The HW Wilson Co

Set     Items   Description
S1      12906   RETICLE? ? OR PHOTOMASK? ? OR PHOTO()MASK? ?
S2         93   S1(5N)(DATABASE? ? OR DATA()BASE? ? OR DBM OR DBMS OR RDBM
               OR RDBMS OR REPOSITOR??? OR DIRECTORY OR DIRECTORIES OR DATA(-
               )STORE? ? OR SERVER? ? OR TABLE? ? OR LIST????)
S3        260   S1(10N)(INSPECT?? OR CLEAN????) OR BARE(1W)S1 OR (KITTED OR
               PREKITTED)(1W)S1
S4        386   S1(3N)(MANAG??? OR MANAGEMENT OR INVENTOR??? OR TRACK???)
S5         13   S3 AND S4
S6          3   S2 AND S4
S7         15   S5:S6
S8         14   RD (unique items)
S9         10   S2 AND S3
S10        71   RETICLE? ?(5N)(DATABASE? ? OR DATA()BASE? ? OR REPOSITOR??-
               ?)
S11        71   S9:S10
S12        40   RD (unique items)
S13        33   S12 NOT PY=2001:2003
S14        32   S13 NOT S8
S15        17   S14 NOT DIE(1W)DATABASE
```

15/5/8 (Item 3 from file: 2)
DIALOG(R)File 2:INSPEC

5147532 INSPEC Abstract Number: B9602-2550G-065, C9602-7410D-097
Title: Mask/reticle making control system
Author(s): Akutagawa, S.; Araihara, S.; Sakai, I.
Author Affiliation: Fujitsu Labs. Ltd., Kawasaki, Japan
Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.2512 p.548-51
Publisher: SPIE-Int. Soc. Opt. Eng,
Publication Date: 1995 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(1995)2512L.548:MRMC;1-Y
Material Identity Number: C574-95192
U.S. Copyright Clearance Center Code: 0 8194 1870 6/95/$6.00
Conference Title: Photomask and X-Ray Mask Technology II
Conference Sponsor: SPIE; Photomask Japan; BACUS; et al
Conference Date: 20-21 April 1995 Conference Location: Kawasaki City, Japan
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Practical (P)
Abstract: Mask making is the first step in semiconductor device manufacturing. Production and development times for new devices depend entirely upon mask delivery time. A system which can manage mask making and delivery quickly is necessary, and it is very important to control the varied information for the many kinds of mask for ASIC use quickly. It is also important to control the many mask processing parameters, i.e. to memorize the parameters and to use the appropriate parameters when masks for general purpose devices such as memory devices are revisited. A database system for information and parameter control has been requested by many mask and device makers. We have constructed a unitary database which includes a large amount of information on various ASIC devices and various processing parameters of memory devices, and information on the mask making production process, indicating the whereabouts of the masks in the production cycle. We have constructed a new mask/ **reticle** making control system using the **database** . (0 Refs)
Subfile: B C
Descriptors: application specific integrated circuits; circuit layout CAD ; data handling; database management systems; integrated circuit layout; integrated circuit manufacture; integrated memory circuits; reticles
Identifiers: mask/reticle making control system; semiconductor device manufacturing; production time; development time; mask delivery time; mask making; ASIC mask data; mask processing parameters; general purpose devices ; mask making production process; database system; parameter control; information control; unitary database; ASIC devices; memory devices; production cycle
Class Codes: B2550G (Lithography); B2570 (Semiconductor integrated circuits); B1130B (Computer-aided circuit analysis and design); B1265D (Memory circuits); B0170E (Production facilities and engineering); C7410D (Electronic engineering computing); C5320G (Semiconductor storage); C3350E (Control applications in the electronics industry)

15/5/14 (Item 9 from file: 2)
DIALOG(R)File 2:INSPEC

02032964 INSPEC Abstract Number: B83024225
Title: Reticle inspection technology to compare the pattern against data
Author(s): Awamura, D.
Author Affiliation: NJS Corp., Yokohama, Japan
Journal: Proceedings of the SPIE - The International Society for Optical Engineering vol.334 p.208-15
Publication Date: 1982 Country of Publication: USA

CODEN: PSISDG ISSN: 0277-786X
Conference Title: Optical Microlithography. Technology for the Mid-1980s
Conference Date: 31 March-1 April 1982 Conference Location: Santa Clara, CA, USA
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Practical (P)
Abstract: Describes a newly developed and very innovative reticle inspection system, the purpose of which is to make a comparison between the **reticle** pattern and the **data base** stored on the mag tape. Also includes the operational report from a couple of semiconductor companies where the systems are already installed and are operating very successfully. The system is capable of providing all the necessary information regarding the detected defects, such as location and type to the plotter, repair system (Zapper) and other peripherals by either on-line or off-line methods. One of the key features of this system is that all the defects detected electronically can be reviewed and confirmed by the human eye. The use of this system is expected to result in a higher device yield. (0 Refs)
Subfile: B
Descriptors: automatic testing; inspection; masks; semiconductor device manufacture
Identifiers: semiconductor device manufacture; reticle inspection system; reticle pattern; data base; mag tape; repair system; device yield
Class Codes: B0170L (Inspection and quality control); B2550 (Semiconductor device technology); B2550G (Lithography)

15/5/15 (Item 1 from file: 94)
DIALOG(R)File 94:JICST-EPlus

01169724 JICST ACCESSION NUMBER: 91A0076741 FILE SEGMENT: JICST-E
Advanced 5X reticle inspection technologies for ULSI devices.
TAKEUCHI SUSUMU (1); YOSHIDA MIYOSHI (1); MORIIZUMI KOICHI (1); WATAKABE YAICHIRO (1)
(1) Mitsubishi Electric Corp.
Handotai, Shuseki Kairo Gijutsu Shinpojiumu Koen Ronbunshu(Proceedings of the Symposium on Semiconductors and Integrated Circuits Technology), 1990, VOL.38th, PAGE.85-90, FIG.8, TBL.1, REF.1
JOURNAL NUMBER: F0108BAP
UNIVERSAL DECIMAL CLASSIFICATION: 621.382.08 681.327
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Conference Proceeding
ARTICLE TYPE: Original paper
MEDIA TYPE: Printed Publication
ABSTRACT: The complexity of ULSI devices, such as 64Mbit DRAM's and 16Mbit SRAM's, in combination with the deep submicron defect sensitivity of these devices had resulted in requirements exceeding the capability of current reticle defect-inspection systems. This paper describes new **database** defect-inspection technologies for 5X **reticles** , an inspection system architecture which is capable of meeting these requirements, and experimental results achieved on actual 5X ULSI reticles. Sensitivities and inspection speed should be considered for the inspection technologies using the data-comparison scheme. To improve the sensitivity without the false defects, the inspection system incorporates a programmable finite impulse response filter which allows edge anomalies such as butting errors and edge roughness to be removed from the image-if desired-while still maintaining high signal from defects. In addition, grey level information is incorporated in the database image generator which minimizes roundoff error and allows the system to faithfully inspect small database features. To keep the inspection ratio, the database generator is capable of expanding compacted data and creating a grey level bit mapped image in real time. Its architecture and theoretical limits are discussed and experimental data is presented. In conclusion, the authors have shown that is now possible to **inspect** ULSI **reticles** for 0.3.MU.m defects with few false defects and with throughputs which are compatible with E-beam

write time. (author abst.)
DESCRIPTORS: VLSI; DRAM; lithography; exposure(photography); excimer laser; mask; fault detection; algorithm; FIR filter; database; adapter; image processing
BROADER DESCRIPTORS: LSI; integrated circuit; micro circuit; RAM; memory(computer); equipment; dynamic memory; gas laser; laser; detection; digital filter; filter(signal); filter; information processing; treatment
CLASSIFICATION CODE(S): NC03040G; JC04060F

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File 603:Newspaper Abstracts 1984-1988
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Set     Items   Description
S1      12906   RETICLE? ? OR PHOTOMASK? ? OR PHOTO()MASK? ?
S2         93   S1(5N)(DATABASE? ? OR DATA()BASE? ? OR DBM OR DBMS OR RDBM
               OR RDBMS OR REPOSITOR??? OR DIRECTORY OR DIRECTORIES OR DATA(-
               )STORE? ? OR SERVER? ? OR TABLE? ? OR LIST????)
S3    4096297   SEMICONDUCT??? OR SEMI()CONDUCT??? OR CHIP?? OR MICROCHIP??
               OR CIRCUIT? ? OR IC OR PCB OR ASIC OR WAFER? ? OR SUBSTRATE?
               ?
S4         57   S2 AND S3
S5         42   RD (unique items)
S6         35   S5 NOT PY=2001:2003
S7         76   AU=(WIESLER, O? OR WIESLER O? OR MARIANO T? OR MARIANO, T?)
S8          0   (S1 OR MASK? ?) AND S7
```

6/5/1 (Item 1 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

06115541 E.I. No: EIP02357060843
Title: Offline analysis techniques for the improvement of defect inspection recipes
Author: Papa Rao, Satyavolu S.; Guldi, Richard; Garvin, James; Lavangkul, Sudtida; Curran, David; Worley, Robin; Hightower, Jesse
Corporate Source: Texas Instruments, Inc., Dallas, TX 75243, United States
Conference Title: 9th International Symposium on Semiconductor Manufacturing
Conference Location: Tokyo, Japan Conference Date: 20000926-20000928
Sponsor: UCS; IEEE EDS; SEMI
E.I. Conference No.: 59409
Source: IEEE International Symposium on Semiconductor Manufacturing Conference, Proceedings n 1 2000. p 277-280 (IEEE cat n 00CH37130)
Publication Year: 2000
ISSN: 1078-8743
Language: English
Document Type: CA; (Conference Article) Treatment: T; (Theoretical); X; (Experimental)
Journal Announcement: 0209W1
Abstract: Yield enhancement techniques for the latest generation of devices need sensitive inspection recipes in order to detect the ever-smaller defects that can result in yield loss. Offline analysis techniques (using MATLAB, for example) for the improvement of bright-field defect-inspection tool recipes are presented. Simple techniques are given for the rapid incorporation or modification of care-areas/don't-care areas into pre-existing recipes. Post-processing analyses of defect data are presented to show their efficacy in improving the signal-to-noise ratio for defects that might otherwise be hidden in the noise created by 'nuisance' defects. Examples are presented to show how design- **databases** and **reticle** inspection data can be harnessed in understanding defect mechanisms. 5 Refs.
Descriptors: **Semiconductor** device manufacture; Signal to noise ratio; Database systems; Spurious signal noise; Image processing; Correlation methods
Identifiers: Offline image processing
Classification Codes:
714.2 (Semiconductor Devices & Integrated Circuits); 716.1 (Information & Communication Theory); 701.1 (Electricity, Basic Concepts & Phenomena); 723.3 (Database Systems); 922.2 (Mathematical Statistics)
714 (Electronic Components & Tubes); 716 (Electronic Equipment, Radar, Radio & Television); 701 (Electricity & Magnetism); 723 (Computer Software, Data Handling & Applications); 922 (Statistical Methods)
71 (ELECTRONICS & COMMUNICATION ENGINEERING); 70 (ELECTRICAL ENGINEERING, GENERAL); 72 (COMPUTERS & DATA PROCESSING); 92 (ENGINEERING MATHEMATICS)

6/5/2 (Item 2 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

05677711 E.I. No: EIP00105365714
Title: 150nm DR contact holes die-to-database inspection
Author: Kuo, Shen-Chung; Wu, Clare; Eran, Yair; Staud, Wolf; Hemar, Shirley; Lindman, Ofer
Corporate Source: Taiwan Mask Corp
Conference Title: Photomask and Next-Generation Lithography Mask Technology VII
Conference Location: Yokohama, Jpn Conference Date: 19000412-19000413
Sponsor: SPIE-The International Society for Optical Engineering
E.I. Conference No.: 57412
Source: Proceedings of SPIE - The International Society for Optical Engineering v 4066 2000. Society of Photo-Optical Instrumentation

Engineers, Bellingham, WA, USA. p 487-495
Publication Year: 2000
CODEN: PSISDG ISSN: 0277-786X
Language: English
Document Type: CA; (Conference Article) Treatment: G; (General Review)
Journal Announcement: 0011W4
Abstract: Using a failure analysis-driven yield enhancements concept, based on an optimization of the mask manufacturing process and UV reticle inspection is studied and shown to improve the contact layer quality. This is achieved by relating various manufacturing processes to very fine tuned contact defect detection. In this way, selecting an optimized manufacturing process with fine-tuned inspection setup is achieved in a controlled manner. This paper presents a study, performed on a specially designed test reticle, which simulates production contact layers of design rule 250nm, 180nm and 150nm. This paper focuses on the use of advanced UV Reticle inspection techniques as part of the process optimization cycle. Current inspection equipment uses traditional and insufficient methods of small contact-hole inspection and review. (Author abstract)
Descriptors: Masks; Inspection; Database systems; Dies; **Semiconductor** device manufacture; Failure analysis; Optimization; Optical devices; Quality control; Defects
Identifiers: Contact holes; Die to **database** inspection; **Reticle**
Classification Codes:
913.3.1 (Inspection)
714.2 (Semiconductor Devices & Integrated Circuits); 913.3 (Quality Assurance & Control); 723.2 (Data Processing); 921.5 (Optimization Techniques); 723.5 (Computer Applications)
714 (Electronic Components); 913 (Production Planning & Control); 723 (Computer Software); 921 (Applied Mathematics)
71 (ELECTRONICS & COMMUNICATIONS); 91 (ENGINEERING MANAGEMENT); 72 (COMPUTERS & DATA PROCESSING); 92 (ENGINEERING MATHEMATICS)

6/5/3 (Item 3 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

05056758 E.I. No: EIP97093812163
Title: Real-time line-width measurements: a new feature for reticle inspection systems
Author: Eran, Yair; Greenberg, Gad; Joseph, Amnon; Lustig, Cornel; Mizrahi, Eyal
Corporate Source: Orbot Instruments Ltd., Yavne, Isr
Conference Title: Photomask and X-Ray Mask Technology IV
Conference Location: Kawasaki City, Jpn Conference Date: 19970417-19970418
Sponsor: SPIE - Int Soc for Opt Engineering, Bellingham, WA USA
E.I. Conference No.: 23036
Source: Proceedings of SPIE - The International Society for Optical Engineering v 3096 1997. Society of Photo-Optical Instrumentation Engineers, Bellingham, WA, USA. p 480-491
Publication Year: 1997
CODEN: PSISDG ISSN: 0277-786X ISBN: 0-8194-2516-8
Language: English
Document Type: CA; (Conference Article) Treatment: X; (Experimental); A ; (Applications)
Journal Announcement: 9809W1
Abstract: The significance of line width control in mask production has become greater with the lessening of defect size. There are two conventional methods used for controlling line widths dimensions which employed in the manufacturing of masks for sub micron devices. These two methods are the critical dimensions (CD) measurement and the detection of edge defects. Achieving reliable and accurate control of line width errors is one of the most challenging tasks in mask production. Neither of the two methods cited above (namely CD measurement and the detection of edge defects) guarantees the detection of line width errors with good sensitivity over the whole mask area. This stems from the fact that CD measurement provides only statistical data on the mask features whereas

applying edge defect detection method checks defects on each edge by itself, and does not supply information on the combined result of error detection on two adjacent edges. For example, a combination of a small edge defect together with a CD non- uniformity which are both within the allowed tolerance, may yield a significant line width error, which will not be detected using the conventional methods (see figure 1). A new approach for the detection of line width errors which overcomes this difficulty is presented. Based on this approach, a new sensitive line width error detector was developed and added to Orbot's RT-8000 die-to- **database reticle** inspection system. This innovative detector operates continuously during the mask inspection process and scans (inspects) the entire area of the reticle for line width errors. The detection is based on a comparison of measured line width that are taken on both the design database and the scanned image of the reticle. In section 2, the motivation for developing this new detector is presented. The section covers an analysis of various defect types, which are difficult to detect using conventional edge detection methods or, alternatively, CD measurements. In section 3, the basic concept of the new approach is introduced together with a description of the new detector and its characteristics. In section 4, the calibration process that took place in order to achieve reliable and repeatable line width measurements is presented. The description of an experiments conducted in order to evaluate the sensitivity of the new detector is given in section 5, followed by a report of the results of this evaluation. The conclusions are presented in section 6. 4 Refs.

Descriptors: Inspection; **Semiconductor** device manufacture; Real time systems; Masks; Defects; Design; Database systems; Distance measurement

Identifiers: Critical dimensions; Reticle defects

Classification Codes:

913.3.1 (Inspection)

913.3 (Quality Assurance & Control); 714.2 (Semiconductor Devices & Integrated Circuits); 722.4 (Digital Computers & Systems); 723.3 (Database Systems); 943.2 (Mechanical Variables Measurements)

913 (Production Planning & Control); 714 (Electronic Components); 722 (Computer Hardware); 723 (Computer Software); 943 (Mechanical & Miscellaneous Measuring Instruments)

91 (ENGINEERING MANAGEMENT); 71 (ELECTRONICS & COMMUNICATIONS); 72 (COMPUTERS & DATA PROCESSING); 94 (INSTRUMENTS & MEASUREMENT)

6/5/4 (Item 4 from file: 8)

04181411 E.I. No: EIP95032633148

Title: Advanced die-to- database reticle **machine for 64-Mbit DRAMs**

Author: Eran, Yair; Rossman, Gideon

Corporate Source: Orbot Instruments Ltd., Yavne, Isr

Conference Title: Photomask and X-Ray Mask Technology

Conference Location: Kawasaki City, Jpn Conference Date: 19940422

Sponsor: SPIE - Int Soc for Opt Engineering, Bellingham, WA USA

E.I. Conference No.: 22121

Source: Proceedings of SPIE - The International Society for Optical Engineering v 2254 1994. Society of Photo-Optical Instrumentation Engineers, Bellingham, WA, USA. p 356-361

Publication Year: 1994

CODEN: PSISDG ISSN: 0277-786X ISBN: 0-8194-1563-4

Language: English

Document Type: CA; (Conference Article) Treatment: X; (Experimental)

Journal Announcement: 9508W1

Abstract: This report describes the RT-8000 product line of advanced reticle inspection systems for 64 and 256 Mbit DRAMs. The description is given from the system designer point of view. The main issues that are discussed are the methodologies used in the early phase of design and the design guidelines that help to meet the marketing goals. The central subject is the system architecture and its relation to the marketing needs. 0 Refs.

Descriptors: Integrated **circuits** ; Inspection; Design; Quality control

Identifiers: Reticle inspection

Classification Codes:
714.2 (Semiconductor Devices & Integrated Circuits); 913.3 (Quality Assurance & Control)
714 (Electronic Components); 913 (Production Planning & Control)
71 (ELECTRONICS & COMMUNICATIONS); 91 (ENGINEERING MANAGEMENT)

6/5/5 (Item 5 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

04112660 E.I. No: EIP95032624980
Title: Elusive mask defects: the false defect
Author: Reynolds, James A.
Corporate Source: Reynolds Consulting, Sunnyvale, CA, USA
Source: Solid State Technology v 38 n 2 Feb 1995. 2pp
Publication Year: 1995
CODEN: SSTEAP ISSN: 0038-111X
Language: English
Document Type: JA; (Journal Article) Treatment: G; (General Review)
Journal Announcement: 9505W3
Abstract: One of the most subtle and potentially harmful mask defects does not appear on the mask at all. Nevertheless, its presence affects the speed, sensitivity and accuracy of die-to- **database reticle** inspection. This fault is the false or nuisance defect. Preventing this problem requires that mask users be cognizant of the mask inspection process and the factors which influence its accuracy. The specifications of the inspection system, and the concept of the minimum feature size of the final data supplied to the mask maker must be understood. The actual sensitivity of the inspection equipment and the number of false defects found should either be closely monitored using documents supplied by the mask maker, or included as part of the mask specification. 2 Refs.
Descriptors: Masks; **Semiconductor** devices; Integrated **circuits** ; Photolithography; Specifications; Defects; Inspection
Identifiers: Elusive mask defect; **Database reticle** inspection; **Reticle** ; Nuisance defect; Real defect
Classification Codes:
714.2 (Semiconductor Devices & Integrated Circuits); 902.2 (Codes & Standards)
714 (Electronic Components); 902 (Engineering Graphics & Standards)
71 (ELECTRONICS & COMMUNICATIONS); 90 (GENERAL ENGINEERING)

6/5/6 (Item 6 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

03532452 E.I. Monthly No: EIM9212-065585
Title: Novel architecture for high-speed dual-image generation of pattern data for phase-shifting reticle inspection.
Author: Hosono, Kunihiro; Takeuchi, Susumu; Watakabe, Yaichiro; Wihl, Tim ; Brandemuehl, Mark; Joseph, David A.
Corporate Source: Mitsubishi Electric Corp., Itami City, Hyogo, Japan
Conference Title: Integrated Circuit Metrology, Inspection, and Process Control VI
Conference Location: San Jose, CA, USA Conference Date: 19920309
Sponsor: SPIE - Int Soc for Opt Engineering, Bellingham, WA, USA
E.I. Conference No.: 17246
Source: Proceedings of SPIE - The International Society for Optical Engineering v 1673. Publ by Int Soc for Optical Engineering, Bellingham, WA, USA. p 229-241
Publication Year: 1992
CODEN: PSISDG ISSN: 0277-786X ISBN: 0-8194-0828-X
Language: English
Document Type: PA; (Conference Paper) Treatment: X; (Experimental); T; (Theoretical)
Journal Announcement: 9212
Abstract: The pattern data representing ULSI photolithography layers

continues to grow exponentially when viewed at the image plane. Data derivation, verification, conversion, and movement have resulted in significant logistical problems and reticle production bottlenecks even with current device densities and reticle manufacturing technologies. With the advent of phase shifting reticle manufacturing and even more dense ULSI devices, **database** image generation for **reticle** defect inspection becomes an even more serious issue. Examination of 64 MBit pattern characteristics show that total figure counts per layer approach 1 billion figures per layer. Phase shifting structures increase figure counts per layer to over 1 billion figures. Defect sensitivities of 0.40 mu m for chrome defects and 0.30 mu m for phase shift defects are required for 64 MBit reticle inspection. Single die inspection area exceeds 5000 mm**2 and die pixel counts are over 10**1**1 pixels. Current **reticle** inspection **database** image generation technology requires ten hours per inspection pass. Data load times exceed one hour and data conversion to the inspection format exceeds ten hours. Total reticle inspection time in the manufacturing environment may approach 40 hours. A novel pattern generator architecture allowing 64 MBit reticle inspection in one hour is proposed. The NPG architecture includes a new data format, an integrated data conversion package, and a high resolution, high speed image generator. NPG data conversion performance is analyzed and 782 million figure 64 MBit data conversions are performed in less than one minute. Resulting file sizes are one million bytes. The NPG data format is shown to allow increased edge placement resolution to support increased inspection sensitivity. A method for simultaneously generating chrome and phase shift images is presented. 1 refs.

Descriptors: INTEGRATED **CIRCUITS** , ULSI--*Masks; LITHOGRAPHY--Photolithography; DATABASE SYSTEMS--Applications; IMAGING TECHNIQUES; COMPUTER ARCHITECTURE

Identifiers: HIGH-SPEED DUAL-IMAGE GENERATION; PATTERN DATA; PHASE-SHIFTING RETICLE INSPECTION; PATTERN GENERATOR ARCHITECTURE

Classification Codes:

713 (Electronic Circuits); 745 (Printing & Reprography); 723 (Computer Software); 741 (Optics & Optical Devices); 722 (Computer Hardware); 723 (Computer Software)

71 (ELECTRONICS & COMMUNICATIONS); 74 (OPTICAL TECHNOLOGY); 72 (COMPUTERS & DATA PROCESSING)

6/5/7 (Item 7 from file: 8)

02244808 E.I. Monthly No: EIM8704-028995

Title: DESIGN- DATA BASED **INSPECTION OF** PHOTOMASKS **AND** RETICLES .

Author: Yabumoto, Seiichi; Arai, Tetsuyuki; Fujimori, Yoshihiko; Azuma, Toru

Corporate Source: Nippon Kogaku KK, Tokyo, Jpn

Conference Title: Optical Microlithography V.

Conference Location: Santa Clara, CA, USA Conference Date: 19860313

Sponsor: SPIE, Bellingham, WA, USA

E.I. Conference No.: 09413

Source: Proceedings of SPIE - The International Society for Optical Engineering v 633. Publ by SPIE, Bellingham, WA, USA p 138-144

Publication Year: 1986

CODEN: PSISDG ISSN: 0277-786X ISBN: 0-89252-668-8

Language: English

Document Type: PA; (Conference Paper)

Journal Announcement: 8704

Abstract: This paper overviewed defect detection logic, data conversion function, and defect detection sensitivity. A New automatic design-based inspection system called Nikon RMX has been developed. With its unique algorithm of comparing photomasks and reticles with their design data, good defect detection sensitivity and low false-defect detection are achieved. Firstly, the design data are converted into Nikon Format Data and stored in a magnetic disc device. At this time, more than one files can be merged together. A magnified image of the sample on the X-Y stage is converted to a bit-pattern image. Synchronized to the image of sample, Nikon Format Data

are transferred from the disc, and a bit-pattern image of design data is generated on the frame memory. All of defect analysis is performed by hardware-logic, so very fast inspection is possible. (Edited author abstract)
Descriptors: LITHOGRAPHY--*Photolithography; INTEGRATED **CIRCUIT** MANUFACTURE--Inspection
Identifiers: DESIGN- **DATA BASED** INSPECTION; **PHOTOMASKS** ; **RETICLES** ; AUTOMATIC DESIGN-BASED INSPECTION SYSTEM; NIKON RMX
Classification Codes:
745 (Printing & Reprography); 742 (Cameras & Photography); 713 (Electronic Circuits)
74 (OPTICAL TECHNOLOGY); 71 (ELECTRONICS & COMMUNICATIONS)

6/5/8 (Item 8 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

02244807 E.I. Monthly No: EIM8704-028994
Title: DIE-TO-DATABASE INSPECTION AN EFFECTIVE METHOD OF DETECTING AND LOCATING DEFECTS ON RETICLES.
Author: Jozefov, Eileen; Follis, Steve; Ruch, Wayne
Corporate Source: Harris Semiconductor, Melbourne, FL, USA
Conference Title: Optical Microlithography V.
Conference Location: Santa Clara, CA, USA Conference Date: 19860313
Sponsor: SPIE, Bellingham, WA, USA
E.I. Conference No.: 09413
Source: Proceedings of SPIE - The International Society for Optical Engineering v 633. Publ by SPIE, Bellingham, WA, USA p 129-137
Publication Year: 1986
CODEN: PSISDG ISSN: 0277-786X ISBN: 0-89252-668-8
Language: English
Document Type: PA; (Conference Paper)
Journal Announcement: 8704
Abstract: Glass **wafers** imaged from single or multi-die reticles can be inspected using a die-to-database inspection technique in which the optical image is compared to the Calma database. With this method, not only is information obtained that pertains to printable contamination on or beneath the pellicle surface, but additional information is acquired that verifies the integrity of the **IC** pattern itself. If the die-to-database technique is used, the location of the defects can be plotted on the reticle plot generated during the format conversion, and an evaluation of the critical nature of the location of the defect can be made. This paper will discuss the inspection of aluminum glass **wafers** using the KLA-221 Klaris Die-to-Database Inspection System.
Descriptors: LITHOGRAPHY--*Photolithography; INTEGRATED **CIRCUIT** MANUFACTURE--Inspection
Identifiers: DIE-TO- **DATABASE** INSPECTION; **RETICLES** ; ALUMINUM GLASS **WAFERS**
Classification Codes:
745 (Printing & Reprography); 742 (Cameras & Photography); 713 (Electronic Circuits)
74 (OPTICAL TECHNOLOGY); 71 (ELECTRONICS & COMMUNICATIONS)

6/5/9 (Item 9 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

01673806 E.I. Monthly No: EIM8408-061580
Title: AUTOMATIC RETICLE INSPECTION TECHNIQUE FOR WAFER **STEPPERS.**
Author: Suzuki, Yoshiki; Yamazaki, Teruhiko
Corporate Source: Computer Development Lab Ltd, Itami City, Jpn
Conference Title: Proceedings of the Microelectronics Seminar, INTERFACE '82.
Conference Location: San Diego, Calif, USA Conference Date: 19821021
Sponsor: Eastman Kodak Co, Rochester, NY, USA
E.I. Conference No.: 03840

Source: Kodak Publication n G-136. Publ by Eastman Kodak Co, Rochester, NY, USA p 38-46
Publication Year: 1983
CODEN: KOPBDJ ISSN: 0730-8698 ISBN: 0-87985-338-7
Language: English
Document Type: PA; (Conference Paper)
Journal Announcement: 8408
Descriptors: INTEGRATED **CIRCUITS** , LSI--*Inspection
Identifiers: AUTOMATIC RETICLE INSPECTION; DIRECT **WAFER** STEPPERS; SUPERIOR PATTERN RESOLUTION; **DATABASE** INSPECTION SYSTEM (DBIS); MINIMUM TRANSFERABLE **RETICLE** DEFECT; CHROMESPOT DEFECTS; REDUCTION RATIO (RR); PINHOLE DEFECTS; EDGE DEFECTS; OPTICAL PATTERN GENERATION
Classification Codes:
713 (Electronic Circuits); 913 (Production Planning & Control); 741 (Optics & Optical Devices); 723 (Computer Software)
71 (ELECTRONICS & COMMUNICATIONS); 91 (ENGINEERING MANAGEMENT); 74 (OPTICAL TECHNOLOGY); 72 (COMPUTERS & DATA PROCESSING)

6/5/10 (Item 10 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

01307962 E.I. Monthly No: EIM8306-043716
Title: AUTOMATIC DETECTION AND QUANTIFICATION OF CONTAMINANTS ON RETICLES FOR SEMICONDUCTOR **MICROLITHOGRAPHY.**
Author: Quackenbos, George; Broude, Sergey; Chase, Eric
Corporate Source: Geophysics Corp of America, Technology Div, Bedford, Mass, USA
Conference Title: Integrated Circuit Metrology.
Conference Location: Arlington, Va, USA Conference Date: 19820504
Sponsor: SPIE, Bellingham, Wash, USA; NBS, Gaithersburg, Md, USA
E.I. Conference No.: 02087
Source: Proceedings of SPIE - The International Society for Optical Engineering v 342. Publ by SPIE, Bellingham, Wash, USA p 35-43
Publication Year: 1982
CODEN: PSISDG ISSN: 0277-786X ISBN: 0-89252-377-8
Language: English
Document Type: PA; (Conference Paper)
Journal Announcement: 8306
Descriptors: *LASER BEAMS--*Instruments
Identifiers: MICROLITHOGRAPHIC RETICLE SURFACES AUTOMATIC INSPECTION SYSTEMS; INDIVIDUAL **RETICLE** PATTERNS **DATABASE** ; FOCUSED LASER BEAM INSTRUMENT TO SCAN RETICLE SURFACES; CONTAMINANTS SIZE AND LOCATION IDENTIFICATION SIGNAL PROCESSING; MANUAL INTERVENTION CONTAMINATION REDUCTION AUTOMATIC RETICLE HANDLIN; **SEMICONDUCTOR** CONTAMINANT SURFACE MEASUREMENT TECHNIQUE
Classification Codes:
744 (Lasers); 732 (Control Devices); 714 (Electronic Components); 943 (Mechanical & Miscellaneous Measuring Instruments)
74 (OPTICAL TECHNOLOGY); 73 (CONTROL ENGINEERING); 71 (ELECTRONICS & COMMUNICATIONS); 94 (INSTRUMENTS & MEASUREMENT)

6/5/11 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC

6729376 INSPEC Abstract Number: B2000-11-2550G-054, C2000-11-3350E-007
Title: Finding killer CD variations by full-reticle CD mapping
Author(s): Hemar, S.; Gottlib, G.
Author Affiliation: Process Diagnostics & Control Group, Appl. Mater., Rehovot, Israel
Journal: Microlithography World vol.9, no.3 p.4, 6, 8, 10
Publisher: PennWell Publishing,
Publication Date: Summer 2000 Country of Publication: USA
CODEN: MCWRE7 ISSN: 1074-407X
SICI: 1074-407X(200022)9:3L.4:FKVF;1-C

Material Identity Number: C269-2000-004
Language: English Document Type: Journal Paper (JP)
Treatment: Practical (P); Experimental (X)
Abstract: A tool that compares all the CDs on a **reticle** to **database** values and averages the biases thus measured in 200*50 mu m "tiles" can identify killer CD defects and facilitate statistical process control at the mask fab. (2 Refs)
Subfile: B C
Descriptors: automatic optical inspection; integrated **circuit** measurement; photolithography; reticles; size measurement; statistical process control
Identifiers: killer CD variations; full-reticle CD mapping; CD comparison tool; reticle CDs; database CD values; CD bias averaging; killer CD defect identification; statistical process control; mask fab; 200 micron; 50 micron
Class Codes: B2550G (Lithography (semiconductor technology)); B0170S (Control equipment and processes in production engineering); B2570 (Semiconductor integrated circuits); B7320C (Spatial variables measurement); B0170L (Inspection and quality control); C3350E (Control applications in the electronics industry); C3355Z (Control applications in other manufacturing processes)
Numerical Indexing: size 2.0E-04 m; size 5.0E-05 m

6/5/12 (Item 2 from file: 2)
DIALOG(R)File 2:INSPEC

6705128 INSPEC Abstract Number: B2000-10-2550G-134
Title: High resolution ultraviolet defect inspection of DAP reticles (Darkfield Alternate Phase) reticles
Author(s): Liebmann, L.; Mansfield, S.; Wong, A.; Smolinski, J.; Peng, S. ; Kimmel, K.; Rudzinski, M.; Wiley, J.; Zurbrick, L.
Author Affiliation: IBM Microelectron., Hopewell Junction, NY, USA
Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.3873, pt.1-2 p.148-61
Publisher: SPIE-Int. Soc. Opt. Eng,
Publication Date: 1999 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(1999)3873:1/2L.148:HRUD;1-2
Material Identity Number: C574-2000-054
U.S. Copyright Clearance Center Code: 0277-786X/99/$10.00
Conference Title: 19th Annual Symposium on Photomask Technology
Conference Sponsor: SPIE
Conference Date: 15-17 Sept. 1999 Conference Location: Monterey, CA, USA
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Practical (P)
Abstract: The manufacturing implementation of alternating aperture PSM's (AltPSM) has been gated by the impacts these techniques have on reticle manufacturing, specifically reticle defect inspection and repair. Die-to-die inspection techniques have been achieved for some clearfield multiphase alternate phase **reticles** , but the required die-to- **database** solutions are not currently available with defect inspection systems. In response to these mask manufacturing issues and **IC** design layout issues, resolution enhancing techniques based on Darkfield Alternate Phase (DAP) reticle designs are now of growing importance. A DAP Programmed Evaluation Reticle, DAPPER, was fabricated and inspected on a new high numerical aperture ultraviolet reticle inspection system. The results show reasonable defect sensitivity performance in the presence of both reticle geometry and quartz etch topography characteristic of 130 nm node advanced logic **circuit** DAP reticles. (4 Refs)
Subfile: B
Descriptors: inspection; nanotechnology; phase shifting masks; reticles; ultraviolet lithography

Identifiers: high resolution ultraviolet defect inspection; DAP reticles; Darkfield Alternate Phase reticles; alternating aperture PSM; reticle defect inspection; repair; die-to-die inspection techniques; clearfield multiphase alternate phase reticles; **IC** design layout issues; DAP Programmed Evaluation Reticle; DAPPER; high numerical aperture ultraviolet reticle inspection system; reticle geometry; quartz etch topography; 130 nm node advanced logic **circuit** DAP reticles; 130 nm

Class Codes: B2550G (Lithography (semiconductor technology)); B0170L (Inspection and quality control); B2550N (Nanometre-scale semiconductor fabrication technology)

Numerical Indexing: size 1.3E-07 m

6/5/13 (Item 3 from file: 2)

DIALOG(R)File 2:INSPEC

6283535 INSPEC Abstract Number: B1999-08-2550G-018, C1999-08-7410D-026

Title: Applying OPC at the mask shop

Author(s): Rosenbusch, A.; Fryer, H.; Martin, B.

Author Affiliation: SIGMA-C, Campbell, CA, USA

Journal: Microlithography World vol.8, no.2 p.17-19

Publisher: PennWell Publishing,

Publication Date: Spring 1999 Country of Publication: USA

CODEN: MCWRE7 ISSN: 1074-407X

SICI: 1074-407X(199921)8:2L.17:AMS;1-9

Material Identity Number: C269-1999-002

Language: English Document Type: Journal Paper (JP)

Treatment: Applications (A); Practical (P)

Abstract: Near the limits of optical lithography, one must optimize both the process parameters and the design-layout to avoid unacceptable imaging distortions. There are several optical proximity correction (OPC) software packages on the market intended to eliminate the predictable distortions. All of these systems modify the **photomask data based** on aerial image simulations or a full description of the **wafer** printing process in order to overcome such optical proximity effects as iso-dense-bias, end-of-line shortening, and corner rounding. However, it is often unclear as to who is responsible for parametrization and application of those corrections. OPC can be successfully applied at the mask shop if the **wafer** fab and software vendor share software and expertise. This paper presents a case study where the mask shop takes the responsibility of modifying the data by applying OPC. Of course, this can only be done in close collaboration with the end-user in the fab, who must provide an accurate description of the optical proximity effects. (3 Refs)

Subfile: B C

Descriptors: **circuit** layout CAD; integrated **circuit** layout; masks; photolithography; proximity effect (lithography); **semiconductor** process modelling; software tools

Identifiers: OPC; mask shop; optical lithography; process parameters optimization; design-layout optimization; optical proximity correction; imaging distortions; OPC software packages; image distortions; photomask data modification; aerial image simulations; **wafer** printing process; optical proximity effects; iso-dense-bias; end-of-line shortening; corner rounding; parametrization; **wafer** fab; software vendor

Class Codes: B2550G (Lithography (semiconductor technology)); B2570A (Semiconductor integrated circuit design, layout, modelling and testing); B2550X (Semiconductor process modelling and simulation); B1130B (Computer-aided circuit analysis and design); C7410D (Electronic engineering computing); C6115 (Programming support)

6/5/14 (Item 4 from file: 2)

DIALOG(R)File 2:INSPEC

6012507 INSPEC Abstract Number: B9810-2550G-040

Title: Improved image acquistion for advanced reticle inspection
Author(s): Eran, Y.; Greenberg, G.; Segev, A.
Author Affiliation: Orbot Appl., Yavne, Israel
Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.3236 p.114-23
Publisher: SPIE-Int. Soc. Opt. Eng,
Publication Date: 1998 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(1998)3236L.114:IIAA;1-R
Material Identity Number: C574-98070
U.S. Copyright Clearance Center Code: 0277-786X/98/$10.00
Conference Title: 17th Annual Symposium on Photomask Technology and Management
Conference Sponsor: SPIE
Conference Date: 17-19 Sept. 1997 Conference Location: Redwood City, CA, USA
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Practical (P); Experimental (X)
Abstract: The ability to inspect sub-micron features is an essential need for the manufacturing of advanced reticles. The shrinking of the minimal line width and the need for detecting smaller defects present a challenge for die-to- **database reticle** inspection. To meet this challenge, Orbot-Applied has developed an improved image acquisition (IIA) method and integrated it into its new RT-8000ES Die-to- **Database reticle** inspection system. The introduction of the IIA module made possible the detection of smaller defects and the ability to inspect smaller features, while maintaining all the other advantages of the field proven RT-8000 system. The evaluation of the RT-8000ES performance included scanning special test reticles with sub-micron features, containing different types of programmed defects of varying sizes. The evaluations's results show the RT-8000ES has the ability to inspect advanced reticles with lines down to 0.6 micron in width, while detecting defects as small as 0.15 microns, with no false defects. With this new improved image acquisition capability, the RT-8000ES has the ability to inspect current and future advanced reticles with high defect detection sensitivity and high reliability. (5 Refs)
Subfile: B
Descriptors: inspection; reticles
Identifiers: image acquistion; RT-8000ES Die-to- **Database reticle** inspection system; IIA module; defect detection; submicron **semiconductor** device; line width
Class Codes: B2550G (Lithography); B0170L (Inspection and quality control)

6/5/15 (Item 5 from file: 2)
DIALOG(R)File 2:INSPEC

5604764 INSPEC Abstract Number: B9707-2550G-077
Title: Subhalf-micron mask defect detectability and printability at 1* reticle magnification
Author(s): Schurz, D.; Flack, W.W.; Newman, G.
Author Affiliation: Ultratech Stepper Inc., San Jose, CA, USA
Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.2884 p.149-66
Publisher: SPIE-Int. Soc. Opt. Eng,
Publication Date: 1996 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(1996)2884L.149:SMMD;1-0
Material Identity Number: C574-97029
U.S. Copyright Clearance Center Code: 0 8194 2282 7/96/$6.00
Conference Title: 16th Annual Symposium on Photomask Technology and Management
Conference Sponsor: SPIE

Conference Date: 18-20 Sept. 1996 Conference Location: Redwood City, CA, USA

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Practical (P); Experimental (X)

Abstract: There have been several studies on the printability of sub-0.5 mu m defects using reduction steppers. These studies typically involve 1* reticles with defect sizes >0.3 mu m. As sub- mu m 1* projection systems are being incorporated into numerous fabrication lines, there is a clear need to determine the impact of sub-0.5 mu m defects using these systems. This paper examines defect detection and measurement capability on 1* reticles and the printability of those defects on production sub- mu m 1* steppers. This analysis enhances the understanding of the relationship between defect size and 1* projection optics and allows determination of optimal defect specifications. A test reticle representative of a 64 Mb DRAM metal layer was manufactured with a programmed series of attached and isolated defects ranging from 0.15-0.5 mu m. Both clear and opaque polarity defects were designed. The defects were identified and measured on two different reticle autoinspection systems. The performance of the two systems was compared to the **reticle database** to evaluate capture rates and efficiency. Actual reticle defect sizes were measured using low voltage SEM. Defect printability was determined using a 1* i-line projection stepper with focus and exposure optimized for nominal CDs. The defects that printed on the **wafer** were measured and compared to the defects measured on the reticle. The effects of varying **wafer** exposure dose and focus within a 10% CD process window on defect printability were also evaluated. The results of the mask inspection comparison and the reticle versus **wafer** defect maps are compared. (12 Refs)

Subfile: B

Descriptors: DRAM **chips** ; fault location; inspection; integrated **circuit** interconnections; integrated **circuit** measurement; integrated **circuit** metallisation; integrated **circuit** reliability; integrated **circuit** testing; integrated **circuit** yield; photolithography; reticles; scanning electron microscopy

Identifiers: mask defect detectability; mask defect printability; reticle magnification; reduction steppers; reticles; defect size; defect detection; defect measurement; projection optics; optimal defect specifications; test reticle; DRAM metal layer; attached defects; isolated defects; opaque polarity defects; clear polarity defects; reticle autoinspection systems; **reticle database** ; capture rates; reticle defect size; low voltage SEM; i-line projection stepper; 64 Mbit; 0.15 to 0.5 micron

Class Codes: B2550G (Lithography); B0170E (Production facilities and engineering); B0170N (Reliability); B2570 (Semiconductor integrated circuits); B0170L (Inspection and quality control); B1265D (Memory circuits); B2550F (Metallisation and interconnection technology)

Numerical Indexing: storage capacity 6.7E+07 bit; size 1.5E-07 to 5.0E-07 m

6/5/16 (Item 6 from file: 2)

DIALOG(R)File 2:INSPEC

5604763 INSPEC Abstract Number: B9707-2550G-076

Title: Mask inspection and real-time line width measurements

Author(s): Eran, Y.; Greenberg, G.; Joseph, A.

Author Affiliation: Orbot Syst. Ltd., Yavne, Israel

Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.2884 p.138-48

Publisher: SPIE-Int. Soc. Opt. Eng,

Publication Date: 1996 Country of Publication: USA

CODEN: PSISDG ISSN: 0277-786X

SICI: 0277-786X(1996)2884L.138:MIRT;1-W

Material Identity Number: C574-97029

U.S. Copyright Clearance Center Code: 0 8194 2282 7/96/$6.00

Conference Title: 16th Annual Symposium on Photomask Technology and

Management
Conference Sponsor: SPIE
Conference Date: 18-20 Sept. 1996 Conference Location: Redwood City, CA, USA
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Practical (P); Experimental (X)
Abstract: Controlling line width error is one of the most challenging tasks in mask production. Current methods for monitoring line width are based on either CD measurements or edge defect detection. Neither method guarantees the detection of line width errors with good sensitivity over the whole mask area. For example, a combination of small edge defects together with CD nonuniformity within the allowed tolerance can yield a significant line width error which is not detected using conventional methods. In this paper, we present a new approach for line width error detection. The method, a new feature of Orbot's RT-8000 die-to- **database** **Reticle** Inspection System, is a sensitive detector that operates during the inspection of the entire reticle area. The detection is based on a comparison of measured line widths on both the **database** and the scanned **reticle** image. In section 2, the motivation for this new detector is driven. An analysis of various defect types, which are difficult to detect using an edge detection approach or CD measurements, is presented. In section 3, the basic concept of the new approach is introduced together with a description of the new detector and its characteristics. In section 4, the calibration process that took place in order to evaluate the sensitivity of the detector is described. The experimental results of this evaluation are reported in section 5. (3 Refs)
Subfile: B
Descriptors: calibration; edge detection; error detection; inspection; integrated **circuit** measurement; integrated **circuit** reliability; integrated **circuit** testing; integrated **circuit** yield; masks; monitoring ; photolithography; reticles; size measurement
Identifiers: mask inspection; real-time line width measurements; line width error; mask production; line width monitoring; CD measurements; edge defect detection; mask area; small edge defects; CD nonuniformity; Orbot RT-8000 die-to- **database** **Reticle** Inspection System; line width error detection; inspection; reticle; scanned reticle image; defect types; CD measurement; edge detection; calibration process; image detector; sensitivity
Class Codes: B2550G (Lithography); B2570 (Semiconductor integrated circuits); B0170E (Production facilities and engineering); B0170N (Reliability); B7320C (Spatial variables measurement); B7130 (Measurement standards and calibration); B0170L (Inspection and quality control)

6/5/17 (Item 7 from file: 2)
DIALOG(R)File 2:INSPEC

5597338 INSPEC Abstract Number: B9707-2550G-045
Title: Review of defect round table **at** Photomask **Japan '96**
Author(s): Kawahira, H.; Wiley, J.
Author Affiliation: Sony Corp., Kanagawa, Japan
Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.2884 p.532-47
Publisher: SPIE-Int. Soc. Opt. Eng,
Publication Date: 1996 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(1996)2884L.532:RDRT;1-S
Material Identity Number: C574-97029
U.S. Copyright Clearance Center Code: 0 8194 2282 7/96/$6.00
Conference Title: 16th Annual Symposium on Photomask Technology and Management
Conference Sponsor: SPIE
Conference Date: 18-20 Sept. 1996 Conference Location: Redwood City, CA, USA

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: General, Review (G); Practical (P)
Abstract: As defects are becoming one of the most critical issues for next generation mask fabrication, the Photomask Japan '96 Symposium held a round table discussion on mask defect issues including inspection and repair, targeting 0.18 mu m device design rule and below. In order to clarify issues on defect specification, fabrication process feasibility with Cr wet etching/dry etching, and equipment for defect inspection and repair, eight panelists made short presentations and discussed those issues with the audience. From a device manufacturer's standpoint, mask making is required to be one or two generations ahead of the present target design rules, enabling smaller **chip** sizes and resulting in profitable memory devices. New defect types are listed from mask shops as transmission defects, resolution limit defects, semi-transparent defects and corner rounding, for which Cr dry etching is better than Cr wet etching. Equipment makers also summarized critical issues for the next generation. Defect inspection systems have several tasks such as improved sensitivity which is tunable with defect printability, feasibility for the new type defects above, shorter wavelength optics, new system performance benchmark procedures, and preprocessing software improvements to cope with optical proximity effect correction and phase shifting masks. Defect repair systems have several tasks such as accuracy improvement, **substrate** damage reduction, nonCr material repair, 3D repair for alternating phase shifting masks and capability of phase and transmission control. (7 Refs)
Subfile: B
Descriptors: etching; fault location; inspection; integrated **circuit** design; integrated **circuit** measurement; integrated **circuit** reliability; integrated **circuit** testing; integrated **circuit** yield; maintenance engineering; masks; phase shifting masks; photolithography; proximity effect (lithography); quality control
Identifiers: Photomask Japan '96 Symposium; mask fabrication; mask defects; inspection; repair; device design rule; defect specification; fabrication process feasibility; Cr dry etching; Cr wet etching; mask making; **chip** size; memory devices; transmission defects; resolution limit defects; semi-transparent defects; corner rounding; defect printability; system performance benchmark procedures; preprocessing software; optical proximity effect correction; phase shifting masks; 0.18 micron; Cr
Class Codes: B2550G (Lithography); B0170L (Inspection and quality control); B2570 (Semiconductor integrated circuits); B2550E (Surface treatment for semiconductor devices); B0170N (Reliability); B0170E (Production facilities and engineering)
Chemical Indexing:
Cr sur - Cr el (Elements - 1)
Numerical Indexing: size 1.8E-07 m

6/5/18 (Item 8 from file: 2)
DIALOG(R)File 2:INSPEC

5486221 INSPEC Abstract Number: B9703-0170L-006, C9703-7410H-007
Title: Die-to- database **inspection of 256 Mbit DRAMs** reticles
Author(s): Eran, Y.; Elmaliah, N.; Lehman, Y.; Mizrahi, E.; Rossman, G.
Author Affiliation: Orbot Instrum. Ltd., Yavne, Israel
Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.2793 p.261-6
Publisher: SPIE-Int. Soc. Opt. Eng,
Publication Date: 1996 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(1996)2793L.261:DIMD;1-U
Material Identity Number: C574-96215
U.S. Copyright Clearance Center Code: 0 8194 2179 0/96/$6.00
Conference Title: Photomask and X-Ray Mask Technology III
Conference Sponsor: SPIE; BACUS
Conference Date: 18-19 June 1996 Conference Location: Kanagawa, Japan

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Applications (A); Practical (P); Experimental (X)
Abstract: 256 Mbit DRAM devices pose a challenge to mask manufacturers. Shrinking line widths, tighter CD requirements, new lithography enhancement techniques, dense databases, and higher sensitivity to half-tone defects require advanced process and inspection systems. The improvements and changes in mask manufacture translate into three main characteristics of a die-to-database inspection system: image quality, reference data injection and defect detection. In order to meet the 256 Mbit DRAM mask inspection challenge, various enhancements must be implemented in die-to-database inspection systems which bring these characteristics to the required level and give mask makers a highly reliable and sensitive tool. The most significant aspect of 256 Mbit DRAM reticle is feature density, which has a major impact on the inspection system characteristics. In the RT-8000 reticle inspection system, the required image quality is achieved by using g-line optimized optics, custom designed and manufactured by Nikon with 0.75 NA. This optical system together with a scanner controlled by a laser interferometer generates the necessary image quality with to inspect small features with DRAM line/space specification. Reference data injection is effected by the database geometry in general, and the feature density in particular. The importance of reference data injection in die-to-database inspection system follows trends for increased complexity and figure count of recent DRAM generations. This paper looks at the performance of a new reference data injection system, the Data Express, incorporated in the RT-8000 reticle inspection system. (1 Refs)
Subfile: B C
Descriptors: automatic test equipment; **circuit** layout CAD; data handling; DRAM **chips** ; inspection; integrated **circuit** design; integrated **circuit** measurement; integrated **circuit** testing; integrated **circuit** yield; photolithography; reticles; visual databases
Identifiers: die-to-database inspection system; DRAM devices; DRAM reticles; mask manufacture; line width; lithography enhancement techniques; half-tone defects; inspection systems; image quality; reference data injection; defect detection; DRAM mask inspection; RT-8000 reticle inspection system; g-line optimized optics; laser interferometer-controlled scanner; DRAM line/space specification; database geometry; feature density; reference data injection system; Data Express; 256 Mbit
Class Codes: B0170L (Inspection and quality control); B2550G (Lithography); B0170E (Production facilities and engineering); B0170N (Reliability); B2570 (Semiconductor integrated circuits); B1265D (Memory circuits); B1130B (Computer-aided circuit analysis and design); B7210B (Automatic test and measurement systems); C7410H (Computerised instrumentation); C6160S (Spatial and pictorial databases); C5320G (Semiconductor storage); C6130 (Data handling techniques)
Numerical Indexing: storage capacity 2.68E+08 bit

6/5/19 (Item 9 from file: 2)
DIALOG(R)File 2:INSPEC

5147532 INSPEC Abstract Number: B9602-2550G-065, C9602-7410D-097
Title: Mask/reticle making control system
Author(s): Akutagawa, S.; Araihara, S.; Sakai, I.
Author Affiliation: Fujitsu Labs. Ltd., Kawasaki, Japan
Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.2512 p.548-51
Publisher: SPIE-Int. Soc. Opt. Eng,
Publication Date: 1995 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(1995)2512L.548:MRMC;1-Y
Material Identity Number: C574-95192
U.S. Copyright Clearance Center Code: 0 8194 1870 6/95/$6.00
Conference Title: Photomask and X-Ray Mask Technology II
Conference Sponsor: SPIE; Photomask Japan; BACUS; et al

Conference Date: 20-21 April 1995 Conference Location: Kawasaki City, Japan
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Practical (P)
Abstract: Mask making is the first step in **semiconductor** device manufacturing. Production and development times for new devices depend entirely upon mask delivery time. A system which can manage mask making and delivery quickly is necessary, and it is very important to control the varied information for the many kinds of mask for **ASIC** use quickly. It is also important to control the many mask processing parameters, i.e. to memorize the parameters and to use the appropriate parameters when masks for general purpose devices such as memory devices are revisited. A database system for information and parameter control has been requested by many mask and device makers. We have constructed a unitary database which includes a large amount of information on various **ASIC** devices and various processing parameters of memory devices, and information on the mask making production process, indicating the whereabouts of the masks in the production cycle. We have constructed a new mask/ **reticle** making control system using the **database** . (0 Refs)
Subfile: B C
Descriptors: application specific integrated **circuits** ; **circuit** layout CAD; data handling; database management systems; integrated **circuit** layout; integrated **circuit** manufacture; integrated memory **circuits** ; reticles
Identifiers: mask/reticle making control system; **semiconductor** device manufacturing; production time; development time; mask delivery time; mask making; **ASIC** mask data; mask processing parameters; general purpose devices; mask making production process; database system; parameter control ; information control; unitary database; **ASIC** devices; memory devices; production cycle
Class Codes: B2550G (Lithography); B2570 (Semiconductor integrated circuits); B1130B (Computer-aided circuit analysis and design); B1265D (Memory circuits); B0170E (Production facilities and engineering); C7410D (Electronic engineering computing); C5320G (Semiconductor storage); C3350E (Control applications in the electronics industry)

6/5/20 (Item 10 from file: 2)
DIALOG(R)File 2:INSPEC

5147523 INSPEC Abstract Number: B9602-2550G-058
Title: Die-to- database **defect detection for** reticles **of 64 and 256 Mbit DRAMs**
Author(s): Eran, Y.; Greenberg, G.; Rossman, G.
Author Affiliation: Orbot Instrum. Ltd., Yavne, Israel
Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.2512 p.453-6
Publisher: SPIE-Int. Soc. Opt. Eng,
Publication Date: 1995 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(1995)2512L.453:DDDR;1-U
Material Identity Number: C574-95192
U.S. Copyright Clearance Center Code: 0 8194 1870 6/95/$6.00
Conference Title: Photomask and X-Ray Mask Technology II
Conference Sponsor: SPIE; Photomask Japan; BACUS; et al
Conference Date: 20-21 April 1995 Conference Location: Kawasaki City, Japan
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Practical (P); Experimental (X)
Abstract: The development and production of 64 and 256 Mbit DRAMs presents new challenges to mask defect detection. As happened during the development of previous generations of DRAMs, the decrease in the line/space design rule dictates a similar decrease in the specification of

mask defect size. This trend introduces new technologies and new requirements. This paper is concerned with two evolving technologies: layout modification for optical proximity correction (OPC) and phase-shifting masks (PSM). The new technologies pose many issues for the mask maker. In this paper, defect detection is addressed. Cases of OPC reticle inspection are presented and PSM defect detection is discussed. (2 Refs)

Subfile: B

Descriptors: DRAM **chips** ; inspection; integrated **circuit** layout; integrated **circuit** testing; integrated **circuit** yield; phase shifting masks; photolithography; proximity effect (lithography); reticles

Identifiers: die-to-database defect detection; reticles; DRAM development ; DRAM production; mask defect detection; line/space design rule; mask defect size specification; layout modification; optical proximity correction; phase-shifting masks; mask maker; defect detection; OPC reticle inspection; PSM defect detection; 64 Mbit; 256 Mbit

Class Codes: B2550G (Lithography); B0170L (Inspection and quality control); B2570 (Semiconductor integrated circuits); B0170E (Production facilities and engineering); B0170N (Reliability); B1265D (Memory circuits)

Numerical Indexing: storage capacity 6.7E+07 bit; storage capacity 2.68E+08 bit

6/5/21 (Item 11 from file: 2)

DIALOG(R)File 2:INSPEC

5033802 INSPEC Abstract Number: B9510-2550G-038

Title: A reticle correction technique to minimize lens distortion effects

Author(s): Flack, W.W.; Flores, G.E.; Walther, A.; Ferreira, M.

Author Affiliation: Ultratech Stepper Inc., San Jose, CA, USA

Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.2322 p.259-71

Publication Date: 1994 Country of Publication: USA

CODEN: PSISDG ISSN: 0277-786X

U.S. Copyright Clearance Center Code: 0 8194 1653 3/94/$6.00

Conference Title: 14th Annual Symposium on Photomask Technology and Management

Conference Sponsor: BACUS/SPIE

Conference Date: 14-16 Sept. 1994 Conference Location: Santa Clara, CA, USA

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Practical (P); Theoretical (T); Experimental (X)

Abstract: Lens distortion is a major factor in overlay error in mix-and-match lithography due to the use of systems with different field sizes and lens distortion signatures between systems. Lens distortion effects can be minimized by corrections to the design **database** before **reticle** manufacture which can be optimized to a specific lens or generic to remove systematic errors of a lens class. This approach has potential to remove lens distortion as a major overlay error factor for mix-and-match lithography. In this study, the distortion signature of an Ultratech 2244i lens was measured using an advanced registration measurement system. A correction for this distortion signature was applied to the design database and a mix-and-match test reticle fabricated. In order to quantify the effectiveness of this technique, a mix-and-match overlay study was performed using the same Ultratech 2244i and an advanced 5* reduction stepper. Overlay experiments were performed using both corrected and noncorrected reticles on the Ultratech system. An automated metrology system was used to collect overlay measurements distributed over the entire lens field area. Detailed analysis of the lens intrafield component of the overlay error using both reticles illustrates the advantages of applying reticle distortion corrections. (12 Refs)

Subfile: B

Descriptors: CAD; error analysis; error compensation; error correction; integrated **circuit** technology; lenses; minimisation; optical noise;

optical variables measurement; photolithography; position control; reticles
Identifiers: reticle correction technique; lens distortion effects minimization; overlay error; mix-and-match lithography; system field size; lens distortion signature; design database corrections; reticle manufacture ; specific lens optimization; generic lens corrections; systematic lens class errors; Ultratech 2244i lens; registration measurement system; distortion signature correction; mix-and-match test reticle; mix-and-match overlay study; reduction stepper; corrected reticles; reticle distortion corrections; automated metrology system; overlay measurements; lens intrafield component
Class Codes: B2550G (Lithography); B4190 (Other optical system components); B0260 (Optimisation techniques); B2570 (Semiconductor integrated circuits)

6/5/22 (Item 12 from file: 2)
DIALOG(R)File 2:INSPEC

4787989 INSPEC Abstract Number: B9411-2210D-037, C9411-3355F-014
Title: Low-cost calibration: key to effective placement
Author(s): Woodhouse, G.
Author Affiliation: Micron Custom Manuf., Boise, ID, USA
Journal: Surface Mount Technology vol.8, no.5 p.36-7, 39-40
Publication Date: May 1994 Country of Publication: USA
ISSN: 0893-3588
U.S. Copyright Clearance Center Code: 0893-3588/94/$1.00+50
Language: English Document Type: Journal Paper (JP)
Treatment: Practical (P)
Abstract: Owing to ever-decreasing component lead pitches, conventional calibration methods for automated pick-and-place equipment have reached their limits of accuracy and repeatability. The authors present a calibration and capability (CpK) analysis method useable with any placement equipment. It utilizes dimensionally stable glass calibration tooling and an automated optical comparator accurate to +/-0.00015 inch. The instrument's statistical capabilities provide such accurate placement capability analysis data as mean error, standard deviation, CpK range, maximum and minimum values, and percent out-of-tolerance. These data are stored automatically in database form by the comparator's software to aid in analysis and to provide historical performance documentation. The comparator itself is calibrated using a NIST-certified **reticle** . NIST traceability, **databased** documentation and machine capability analysis meet the requirements for ISO 9000 certification. (0 Refs)
Subfile: B C
Descriptors: assembling; calibration; computerised instrumentation; manufacturing computer control; printed **circuit** manufacture; surface mount technology
Identifiers: component lead pitches; effective placement; low-cost calibration; CpK analysis; dimensionally stable glass calibration tooling; automated optical comparator; statistical capabilities; mean error; standard deviation; CpK range; database; historical performance documentation; NIST-certified reticle; NIST traceability; ISO 9000 certification
Class Codes: B2210D (Printed circuit manufacture); B0170E (Production facilities and engineering); B7130 (Measurement standards and calibration) ; C3355F (Assembling); C7420 (Control engineering); C7410D (Electronic engineering); C7410H (Instrumentation)

6/5/23 (Item 13 from file: 2)
DIALOG(R)File 2:INSPEC

4755751 INSPEC Abstract Number: B9410-2550G-078
Title: Reticle specific compensations to meet production overlay requirements for 64 MB and beyond
Author(s): Rogoff, R.; Hong, S.S.; Schramm, D.; Espin, G.

Author Affiliation: ASM Lithography, Tempe, AZ, USA
Journal: Proceedings of the SPIE - The International Society for Optical Engineering vol.2197 p.781-90
Publication Date: 1994 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
U.S. Copyright Clearance Center Code: 0 8194 1492 1/94/$6.00
Conference Title: Optical/Laser Microlithography VII
Conference Sponsor: SPIE
Conference Date: 2-4 March 1994 Conference Location: San Jose, CA, USA
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Practical (P)
Abstract: A novel technology has been developed whereby a **database** of **reticle** specific compensation can be utilized to correct for magnification, rotation, and translational reticle manufacturing errors. Whenever a given reticle is loaded into the stepper, a reticle barcode defining that specific reticle is read. This barcode is associated with a set of reticle specific compensations which are automatically applied during the execution of a production batch. Reticle compensations can be either empirically determined or taken from reticle manufacturing information. Algorithms have been developed which determine reticle specific compensations based on either the manufacturing data or empirically determined data. This data is easily entered into a **database** allowing any stepper to access **reticle** compensation information for any reticle. The authors discuss the procedures involved in determining and implementing reticle specific compensations and present production overlay data indicating overlay performance with and without reticle compensations. (6 Refs)
Subfile: B
Descriptors: bar codes; error compensation; integrated **circuit** manufacture; integrated **circuit** technology; masks; photolithography; process control
Identifiers: algorithms; production overlay requirements; database; reticle specific compensation; manufacturing errors; reticle barcode; overlay performance; 64 Mbit
Class Codes: B2550G (Lithography); B2570 (Semiconductor integrated circuits); B0170E (Production facilities and engineering)
Numerical Indexing: storage capacity 6.7E+07 bit

6/5/24 (Item 14 from file: 2)
DIALOG(R)File 2:INSPEC

4712547 INSPEC Abstract Number: B9409-2550G-026, C9409-7410D-008
Title: LAN integration of photomask tools at IBM Burlington using the IBM RISC/6000
Author(s): Wilbur, E.J.
Author Affiliation: IBM Microelectronics, Burlington, VT, USA
Journal: Proceedings of the SPIE - The International Society for Optical Engineering vol.2087 p.314-20
Publication Date: 1994 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
U.S. Copyright Clearance Center Code: 0 8194 1356 9/94/$6.00
Conference Title: 13th Annual Symposium on Photomask Technology and Management
Conference Sponsor: SPIE
Conference Date: 22-23 Sept. 1993 Conference Location: Santa Clara, CA, USA
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Practical (P)
Abstract: IBM Burlington has made the transition from a purely IBM MVS Host based architecture for writing and inspecting photomasks to an innovative hybrid host and local area network (LAN) solution. This involved going from a pure 9 track host generated tape environment to a IBM RISC/6000 LAN solution. An 80% tape reduction has been realized to date. The transition of the IBM Burlington photomask operational environment is

detailed to show the migration from tape to LAN for current and new equipment. Decision points and rationale that were used in the process are given. Beyond using the standard KLARINET and MEBESNET software from the photomask tools, a new RISC/6000 set of software and a file management system was developed by AB Networks to assist the operators and data personnel. In addition to ETHERNET, new FDDI and token ring technology have been integrated to provide a modern LAN topology at the IBM Burlington site. This flexibility allows greater reliability, faster throughput and is much more cost effective than our previous methodology. The LAN topology is shown with the **photomask** tools. Links to remote file **servers** as part of the architecture is also shown to demonstrate the robustness of the design. (0 Refs)

Subfile: B C

Descriptors: automatic optical inspection; electronic engineering computing; integrated **circuit** manufacture; local area networks; masks; reduced instruction set computing

Identifiers: LAN integration; photomask tools; IBM RISC/6000; hybrid host ; local area network; KLARINET; MEBESNET software; file management system; token ring technology; LAN topology; reliability; remote file servers

Class Codes: B2550G (Lithography); B2570 (Semiconductor integrated circuits); B6210L (Computer communications); B0170L (Inspection and quality control); B0170E (Production facilities and engineering); C7410D (Electronic engineering); C5620L (Local area networks); C3355Z (Other manufacturing processes)

6/5/25 (Item 15 from file: 2)

4579857 INSPEC Abstract Number: B9403-0170L-006, C9403-3355Z-004

Title: Precise reticle defect classification and sizing based on double-tier inspection technique

Author(s): Eran, Y.; Shafrir, S.; Wienberg, I.; Almaliach, N.; Aloni, M.; Sabouri, S.

Author Affiliation: Orbot Instrum., Yavne, Israel

Journal: Proceedings of the SPIE - The International Society for Optical Engineering vol.1926 p.558-69

Publication Date: 1993 Country of Publication: USA

CODEN: PSISDG ISSN: 0277-786X

U.S. Copyright Clearance Center Code: 0 8194 1160 4/93/$6.00

Conference Title: Integrated Circuit Metrology, Inspection, and Process Control VII

Conference Sponsor: SPIE

Conference Date: 2-4 March 1993 Conference Location: San Jose, CA, USA

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Practical (P); Experimental (X)

Abstract: A new scheme for automatic defect classification and sizing is presented. The new scheme is developed for improving the overall production of automatic die-to- **database reticle** inspection equipment for defect detection. The new scheme replaces the time-consuming, inaccurate and non-repeatable traditional methods that are based on human reviewing and verification of defects with the aid of relatively crude image processing electronics. In order to overcome these limitations, a double-tier scheme has been developed for automatic defect classification and sizing (ADCS). The fundamentals of this scheme are presented. The image processing algorithms are described and their overall performance is evaluated using various test and production masks. The reported scheme represents a practical, precise and accurate method for automatic classification and sizing. (9 Refs)

Subfile: B C

Descriptors: image processing; inspection; integrated **circuit** manufacture; integrated **circuit** testing; masks; **semiconductor** technology

Identifiers: reticle defect sizing; automatic sizing; reticle defect classification; double-tier inspection technique; automatic defect classification; image processing algorithms

Class Codes: B0170L (Inspection and quality control); B2550G (Lithography); B2570 (Semiconductor integrated circuits); B6140C (Optical information and image processing); C3355Z (Other manufacturing processes); C5260B (Computer vision and picture processing)

6/5/26 (Item 16 from file: 2)
DIALOG(R)File 2:INSPEC

4433811 INSPEC Abstract Number: B9308-0170L-013, C9308-7480-026
Title: The new role of high sensitivity data base inspection (of masks)
Author(s): LaVoy, R.
Author Affiliation: Intel Corp., Santa Clara, CA, USA
Journal: Proceedings of the SPIE - The International Society for Optical Engineering vol.1809 p.187-93
Publication Date: 1993 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
U.S. Copyright Clearance Center Code: 0 8194 1009 8/93/$4.00
Conference Title: 12th Annual Symposium on Photomask Technology and Management
Conference Sponsor: SPIE
Conference Date: 23-24 Sept. 1992 Conference Location: Sunnyvale, CA, USA
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Practical (P)
Abstract: With the advent of fast throughput and high sensitivity database systems, the use of **database** for inspection of **photo masks** is taking on a new role. The comparison of chrome on glass **photo masks** to the ideal **database** can now be used to quantify mask parameters such as process bias uniformity, edge roughness, and transmission uniformity in addition to defects. Database inspection will move from the realm of a last resort option to a preferred option. The use must now be prepared to understand and use the valuable data now available to them to quantify the quality of their mask, and improve their process. Intel designed artifact masks were created to quantify process bias uniformity in addition to other defects. Using mask to database inspection, critical dimension (CD) process uniformity, and edge roughness in addition to both traditional and thoroughness defects, were quantified throughout the active area. Results presented demonstrate the additional information now available to the Mask Engineer to evaluate mask quality, and implement process changes. (0 Refs)
Subfile: B C
Descriptors: electronic engineering computing; inspection; integrated **circuit** manufacture; masks; production engineering computing
Identifiers: defect inspection; high sensitivity database systems; inspection of photo masks; chrome on glass photo masks; mask parameters; process bias uniformity; edge roughness; transmission uniformity; Intel designed artifact masks; critical dimension; thoroughness defects
Class Codes: B0170L (Inspection and quality control); B2550G (Lithography); B2570 (Semiconductor integrated circuits); C7480 (Production engineering); C3355Z (Other manufacturing processes); C7410D (Electronic engineering)

6/5/27 (Item 17 from file: 2)
DIALOG(R)File 2:INSPEC

03691432 INSPEC Abstract Number: B90055387
Title: Submicron photomask imaging: the key to success is communication
Author(s): Hicks, D.; Kula, K.; Lee, R.; Van Tu
Author Affiliation: Photronics Labs., Brookfield, CT, USA
Journal: Microelectronic Manufacturing and Testing vol.13, no.1 p. 24-5
Publication Date: Jan. 1990 Country of Publication: USA
CODEN: MMTEEN ISSN: 0161-7427
Language: English Document Type: Journal Paper (JP)

Treatment: Practical (P)
Abstract: Quality submicron photomasks are produced through the coordinated efforts of the mask vendor and the customer. A successful four part approach has been used for communicating with customers that require submicron **photomasks** : **listen** to the needs of the mask user, inform mask designers of techniques that maximize E-Beam mask generating quality, establish a common correlation for image measurement, and provide honest channels of feedback in both directions. This article reviews the major communication elements necessary to the establishment of these four components. There are eight process steps that the mask vendor and mask user should discuss before a successful mask can be produced: image size correlation, data preparation, glass blank material type, E-Beam imaging approach, processing and etch strategies, defect inspection and repair strategies, and final image size evaluation. Communicating on these critical technical issues is especially important when submicron projects are involved. (0 Refs)
Subfile: B
Descriptors: integrated **circuit** manufacture; masks
Identifiers: submicron photomask imaging; image size correlation; data preparation; E-Beam imaging approach; etch strategies; defect inspection; repair strategies; final image size evaluation
Class Codes: B2550G (Lithography); B2570 (Semiconductor integrated circuits)

6/5/28 (Item 18 from file: 2)
DIALOG(R)File 2:INSPEC
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02032965 INSPEC Abstract Number: B83024226
Title: Automatic mask and reticle inspection system
Author(s): Hal Yang
Author Affiliation: Engng. Dept., KLA Instruments Corp., Santa Clara, CA, USA
Journal: Proceedings of the SPIE - The International Society for Optical Engineering vol.334 p.216-18
Publication Date: 1982 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
Conference Title: Optical Microlithography. Technology for the Mid-1980s
Conference Date: 31 March-1 April 1982 Conference Location: Santa Clara, CA, USA
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Practical (P); Experimental (X)
Abstract: Automatic photomask inspection systems have been commercially available for a number of years. KLA Instruments has manufactured systems which utilize die-comparison to detect photomask defects. Describes some of the technical modifications and enhancements which augment the basic photomask inspection capability of a die-comparison system by adding the capability to inspect a single-die **reticle** against the **data base** which generated it. (0 Refs)
Subfile: B
Descriptors: inspection; masks; photolithography; **semiconductor** device manufacture
Identifiers: automatic inspection; photomask inspection systems; die-comparison; photomask defects; single-die reticle; data base
Class Codes: B0170L (Inspection and quality control); B2550 (Semiconductor device technology); B2550G (Lithography)

6/5/29 (Item 19 from file: 2)
DIALOG(R)File 2:INSPEC
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02032964 INSPEC Abstract Number: B83024225
Title: Reticle inspection technology to compare the pattern against data
Author(s): Awamura, D.
Author Affiliation: NJS Corp., Yokohama, Japan

Journal: Proceedings of the SPIE - The International Society for Optical Engineering vol.334 p.208-15
Publication Date: 1982 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
Conference Title: Optical Microlithography. Technology for the Mid-1980s
Conference Date: 31 March-1 April 1982 Conference Location: Santa Clara, CA, USA
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Practical (P)
Abstract: Describes a newly developed and very innovative reticle inspection system, the purpose of which is to make a comparison between the **reticle** pattern and the **data base** stored on the mag tape. Also includes the operational report from a couple of **semiconductor** companies where the systems are already installed and are operating very successfully. The system is capable of providing all the necessary information regarding the detected defects, such as location and type to the plotter, repair system (Zapper) and other peripherals by either on-line or off-line methods. One of the key features of this system is that all the defects detected electronically can be reviewed and confirmed by the human eye. The use of this system is expected to result in a higher device yield. (0 Refs)
Subfile: B
Descriptors: automatic testing; inspection; masks; **semiconductor** device manufacture
Identifiers: **semiconductor** device manufacture; reticle inspection system; reticle pattern; data base; mag tape; repair system; device yield
Class Codes: B0170L (Inspection and quality control); B2550 (Semiconductor device technology); B2550G (Lithography)

6/5/30 (Item 20 from file: 2)
DIALOG(R)File 2:INSPEC

00290912 INSPEC Abstract Number: B71025618, C71017351
Title: Computer aided design of photomasks with the use of interactive graphics
Author(s): Richardson, F.K.
Author Affiliation: Applicon Inc., Burlington, MA, USA
Conference Title: Semiconductor integrated circuit processing and production conference (abstracts) p.1 pp.
Publisher: Industrial and Sci. Conference Management, Chicago, IL, USA
Publication Date: 1971 Country of Publication: USA 13 pp.
Conference Sponsor: Industrial and Sci. Conference Management
Conference Date: 15-17 June 1971 Conference Location: New York, NY, USA
Language: English Document Type: Conference Paper (PA)
Treatment: Applications (A); Practical (P)
Abstract: The author describes an interactive computer graphics system that allows a user to generate, view, and edit computer representations of composite integrated or printed **circuit** photomasks. It lets a user input his mask information with free-hand symbols drawn with a stylus on a data **tablet** . The **photomasks** are rapidly displayed on the storage cathode ray tube. Mask changes are made with the corrected masks redisplayed. When a composite design is completed, the system automatically produces data describing individual mask levels for use with automatic artwork generation equipment to make the photomasks or to provide documentation. Data formatters are available for a wide range of artwork equipment.
Subfile: B C
Descriptors: computer graphics; computer-aided **circuit** design; masks; printed **circuits**
Identifiers: **IC** ; printed **circuit** ; photomasks; **circuit** fabrication; computer graphics; interactive computer graphics system; storage cathode ray tube; automatic artwork generation equipment
Class Codes: B1130B (Computer-aided circuit analysis and design); B2220 (Integrated circuits); B2570 (Semiconductor integrated circuits); C7410D (Electronic engineering)

6/5/31 (Item 1 from file: 94)
DIALOG(R)File 94:JICST-EPlus

01169724 JICST ACCESSION NUMBER: 91A0076741 FILE SEGMENT: JICST-E
Advanced 5X reticle inspection technologies for ULSI devices.
TAKEUCHI SUSUMU (1); YOSHIDA MIYOSHI (1); MORIIZUMI KOICHI (1); WATAKABE YAICHIRO (1)
(1) Mitsubishi Electric Corp.
Handotai, Shuseki Kairo Gijutsu Shinpojiumu Koen Ronbunshu(Proceedings of the Symposium on Semiconductors and Integrated Circuits Technology), 1990, VOL.38th, PAGE.85-90, FIG.8, TBL.1, REF.1
JOURNAL NUMBER: F0108BAP
UNIVERSAL DECIMAL CLASSIFICATION: 621.382.08 681.327
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Conference Proceeding
ARTICLE TYPE: Original paper
MEDIA TYPE: Printed Publication
ABSTRACT: The complexity of ULSI devices, such as 64Mbit DRAM's and 16Mbit SRAM's, in combination with the deep submicron defect sensitivity of these devices had resulted in requirements exceeding the capability of current reticle defect-inspection systems. This paper describes new **database** defect-inspection technologies for 5X **reticles** , an inspection system architecture which is capable of meeting these requirements, and experimental results achieved on actual 5X ULSI reticles. Sensitivities and inspection speed should be considered for the inspection technologies using the data-comparison scheme. To improve the sensitivity without the false defects, the inspection system incorporates a programmable finite impulse response filter which allows edge anomalies such as butting errors and edge roughness to be removed from the image-if desired-while still maintaining high signal from defects. In addition, grey level information is incorporated in the database image generator which minimizes roundoff error and allows the system to faithfully inspect small database features. To keep the inspection ratio, the database generator is capable of expanding compacted data and creating a grey level bit mapped image in real time. Its architecture and theoretical limits are discussed and experimental data is presented. In conclusion, the authors have shown that is now possible to inspect ULSI reticles for 0.3.MU.m defects with few false defects and with throughputs which are compatible with E-beam write time. (author abst.)
DESCRIPTORS: VLSI; DRAM; lithography; exposure(photography); excimer laser; mask; fault detection; algorithm; FIR filter; database; adapter; image processing
BROADER DESCRIPTORS: LSI; integrated **circuit** ; micro **circuit** ; RAM; memory(computer); equipment; dynamic memory; gas laser; laser; detection; digital filter; filter(signal); filter; information processing; treatment
CLASSIFICATION CODE(S): NC03040G; JC04060F

6/5/32 (Item 1 from file: 144)
DIALOG(R)File 144:Pascal

12967897 PASCAL No.: 97-0244250
Subhalf-micron mask defect detectability and printability at 1X reticle magnification
16th annual symposium on photomask technology and management : Redwood City CA, 18-20 September 1996
SCHURZ D; FLACK W W; NEWMAN G
SHELDEN Gilbert V, ed; REYNOLDS James A, ed
Ultratech Stepper, Inc., San Jose, CA 95134, United States
International Society for Optical Engineering, Bellingham WA, United States.
Annual symposium on photomask technology and management, 16 (Redwood

City CA USA) 1996-09-18
Journal: SPIE proceedings series, 1996, 2884 149-166
ISSN: 1017-2653 Availability: INIST-21760; 354000062513430140
No. of Refs.: 12 ref.
Document Type: P (Serial); C (Conference Proceedings) ; A (Analytic)
Country of Publication: United States
Language: English

There have been several studies on the printability of subhalf-micron defects using reduction steppers (1,2). These studies typically involve 1X reticles with defect sizes greater than 0.3 mu m. Because submicron 1X projection systems are being incorporated into numerous fabrication lines, there is a clear need to determine the impact of subhalf-micron defects using these systems. This paper examines defect detection and measurement capability on 1X reticles and the printability of those defects on production submicron 1X steppers. This analysis will enhance the understanding of the relationship between defect size and 1X projection optics and allows for determination of optimal defect specifications. A test reticle representative of a 64 Mb DRAM metal layer was manufactured with a programmed series of attached and isolated defects ranging from 0.15 to 0.5 mu m. Both clear and opaque polarity defects were designed. The defects were identified and measured on two different reticle autoinspection systems. The performance of the two systems was compared to the **reticle database** to evaluate capture rates and efficiency. Actual reticle defect sizes were measured using low voltage SEM metrology. Defect printability was determined using a 1X i-line projection stepper with focus and exposure optimized for nominal critical dimensions (CD). The defects that printed on the **wafer** were measured and compared to the defects measured on the reticle. The effects of varying **wafer** exposure dose and focus within a 10 percent CD process window on defect printability were also evaluated. The results of the mask inspection comparison and the reticle versus **wafer** defect maps are compared.

Classification Codes: 001D03F17

6/5/33 (Item 1 from file: 99)
DIALOG(R)File 99:Wilson Appl. Sci & Tech Abs

1245424 H.W. WILSON RECORD NUMBER: BAST95041166
Detecting elusive mask defects
Reynolds, James A;
Solid State Technology v. 38 (June '95) p. 121-2
DOCUMENT TYPE: Feature Article ISSN: 0038-111X LANGUAGE: English
RECORD STATUS: New record

ABSTRACT: The conclusion and summary of an analysis that addressed the causes, effects, and prevention of harmful **photomask** defects are presented. A **table** outlines defect types, a probable cause for each defect, how each defect is manifested on the printed **wafer** , and prevention strategies.

DESCRIPTORS: Photomasks--Testing;

6/5/34 (Item 1 from file: 95)
DIALOG(R)File 95:TEME-Technology & Management

01000760 E96076553026
Die-to- database **defect detection for** reticles **of 64 and 256 Mbit DRAMs**
(Eine Maskendefekterkennungstechnik bei der Fertigung von 64 und 256 Mbit DRAMs)
Eram, Y; Greenberg, G; Rossman, G
Orbot Yavne, IL; Orbot, J
Photomask and X-Ray Mask Technol. II, Kawasaki City, J, Apr 20-21, 19951995

Document type: Conference paper Language: English
Record type: Abstract

ABSTRACT:
The development and production of 64 and 256 Mbit DRAMs presents new challenges to mask defect detection. As happened during the development of previous generations of DRAMs, the decrease in line/space design rule dictates a similar decrease in the specification of mask defect size. This trend introduces new technologies and new requirements. This paper is concerned with two evolving technologies: layout modification for optical proximity correction (OPC) and phase-shift masks (PSM). The new technologies pose many issues for the mask maker. In the paper the defect detection is addressed. In section 2 few cases of OPC reticle inspection are presenteed while in section 3 the defect detection of PSM is discussed.

DESCRIPTORS: DRAM **CHIPS** ; MASK MAKING; DEFECT DETECTION; INSPECTION; PHASE SHIFT; MASKS; MASK TECHNOLOGY; SENSITIVITY; QUALITY INSPECTION; PROXIMITY EFFECT; ERROR CORRECTION
IDENTIFIERS: RETICLE; DRAM-Fertigung; Maskendefekterkennung; Nachbarschaftseffekt

6/5/35 (Item 2 from file: 95)
DIALOG(R)File 95:TEME-Technology & Management

00647486 E93014150007
A novel architecture for high speed dual image generation of pattern data for phase shifting reticle inspection
(Eine neue Architektur zur schnellen Dualbilderzeugung von Musterdaten zur Phasenschieber-Fadenkreuzinspektion)
Kunihiro Mosono; Susumu Takeuchi; Yaichiro Watakabe; Wihl, T; Brandemuehl, M; Joseph, D
Mitsubishi Electric, Itami, J; KLA Instruments, San Jose, USA
Integrated Circuit Metrology, Inspection, and Process Control 6, San Jose, USA, 9-11 March 19921992
Document type: Conference paper Language: English
Record type: Abstract

ABSTRACT:
The pattern data representing ULSI photolithography layers continues to grow exponentially when viewed at the image plane. Data derivation, verification, conversion, and movement have resulted in significant logistical problems and reticle production bottlenecks even with current device densities and reticle manufacturing technologies. With the advent of phase shifting reticle manufacturing and even more dense ULSI devices, **database** image generation for **reticle** defect inspection becomes an even more serious issue. Examination of 64 MBit pattern characteristics show that total figure counts per layer will approach 1 billion figures per layer. Phase shifting structures will increase figure counts per layer to over 1 billion figures. Defect sensitivities of 0.40 micron for chrome defects and 0.30 micron for phase shift defects will be required for 64 MBit reticle inspection. Single die inspection area will exceed 5000 mm(exp 2) and die pixel counts will be over 10(exp 11) pixels. Current **reticle** inspection **database** image generation technology will require ten hours per inspection pass. Data load times will exceed one hour and data conversion to the inspection format will exceed ten hours. Total reticle inspection time in the manufacturing environment may approach 40 hours. A Novel Pattern Generator architecture which will allow 64 MBit reticle inspection in one hour is proposed. The NPG architecture includes a new data format, an integrated data conversion package, and a high resolution, high speed image generator. NPG data conversion performance is analyzed and 782 million figure 64 MBit data conversions are performed in less than one minute. Resulting file sizes are one million bytes. The NPG data format is shown to allow increased edge placement resolution to support increased inspection sensitivity. A method for simultaneously generating chrome and phase shift images is presented.

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File 347:JAPIO Oct 1976-2003/Mar(Updated 030703)
         (c) 2003 JPO & JAPIO
File 350:Derwent WPIX 1963-2003/UD,UM &UP=200347
         (c) 2003  Thomson Derwent

Set     Items   Description
S1      24581   RETICLE? ? OR PHOTOMASK? ? OR PHOTO()MASK? ?
S2        129   S1(5N)(DATABASE? ? OR DATA()BASE? ? OR DBM OR DBMS OR RDBM
                 OR RDBMS OR REPOSITOR??? OR DIRECTORY OR DIRECTORIES OR DATA(-
                 )STORE? ? OR SERVER? ? OR TABLE? ? OR LIST????)
S3        731   S1(10N)(INSPECT?? OR CLEAN????) OR BARE(1W)S1 OR (KITTED OR
                 PREKITTED)(1W)S1
S4         63   S1(3N)(MANAG??? OR MANAGEMENT OR INVENTOR??? OR TRACK???)
S5        192   S2 OR S4
S6         16   S5 AND S3
S7         33   S2:S4 AND IC=G06F
S8         48   S6:S7
```

8/5/4 (Item 4 from file: 347)
DIALOG(R)File 347:JAPIO

06332435 **Image available**
METHOD AND APPARATUS FOR MANUFACTURING SEMICONDUCTOR DEVICE

PUB. NO.: 11-274037 [JP 11274037 A]
PUBLISHED: October 08, 1999 (19991008)
INVENTOR(s): KUMAZAWA TAKAAKI
ISHIKAWA SEIJI
APPLICANT(s): HITACHI LTD
APPL. NO.: 10-074289 [JP 9874289]
FILED: March 23, 1998 (19980323)
INTL CLASS: H01L-021/027; G03F-009/00; H01L-021/00

ABSTRACT
PROBLEM TO BE SOLVED: To surely and quickly determine if a product is good in an exposure step by computing the margin for an alignment deviation of a photo mask by exposure steps, and comparing the margin with measured alignment deviation to determine if the product is good in the process result at each exposure step.

SOLUTION: A data collector 11 collects the result of alignment inspection by an alignment inspector 3 and records histories thereof in an alignment inspection **data** base 12, a **photo mask inspector** 23 computes the margin for the alignment deviation of the **photo mask** , based on the photo mask information, process flow information 22 and alignment control information 25 and makes an alignment margin data base 24 from the computation result, a data processor 4 compares a margin retrieved from the margin data base 24 by every exposure step with the alignment deviation obtained from the alignment inspection result history, and indicates an alarm on a display 5 if the alignment deviation is exceeds the margin.

8/5/6 (Item 6 from file: 347)
DIALOG(R)File 347:JAPIO

06282683 **Image available**
CAD DATA PREPARATION METHOD DEVICE FOR RETICLE

PUB. NO.: 11-224272 [JP 11224272 A]
PUBLISHED: August 17, 1999 (19990817)
INVENTOR(s): SHINOMORI EIJI
APPLICANT(s): TOPPAN PRINTING CO LTD
APPL. NO.: 10-023437 [JP 9823437]
FILED: February 04, 1998 (19980204)
INTL CLASS: **G06F-017/50** ; H01L-021/82

ABSTRACT
PROBLEM TO BE SOLVED: To directly read reticle images for which the fine and complicated circuit pattern of an IC or an LSI or the like is plotted by a scanner and to easily reproduce data for CAD by reading the reticle images with an image data input scanner, converting them into an image external format and converting them from the image external format into a CAD **data base** .

SOLUTION: **Reticle** images are read by scanner (step S1). Bend correction and contrast correction, etc., are executed to image data read by the image input scanner and they are converted into monochromatic 2-gradation bit map image data and then, further converted into an external image format (steps S2 and S3). The bit map image data are compressed in both vertical and horizontal directions and the vertex coordinates of a graphic area calculated (step S4). Then, information of graphic attribute codes or the like is added and they are coverted into the a CAD data base or an

intermediate format for the CAD provided with information required for the CAD database (steps S5 and S6).

8/5/8 (Item 8 from file: 347)

DIALOG(R)File 347:JAPIO

05821068 **Image available**
GRAPHIC DATA DEVELOPING DEVICE BASED ON DESIGN DATA

PUB. NO.: 10-104168 [JP 10104168 A]
PUBLISHED: April 24, 1998 (19980424)
INVENTOR(s): ISOMURA YASUTADA
TSUCHIYA HIDEO
APPLICANT(s): TOSHIBA CORP [000307] (A Japanese Company or Corporation), JP (Japan)
APPL. NO.: 08-254987 [JP 96254987]
FILED: September 26, 1996 (19960926)
INTL CLASS: [6] G01N-021/88; G01B-011/24; G03F-001/08; **G06F-017/50** ; H01L-021/82
JAPIO CLASS: 46.2 (INSTRUMENTATION -- Testing); 29.1 (PRECISION INSTRUMENTS -- Photography & Cinematography); 42.2 (ELECTRONICS -- Solid State Components); 45.4 (INFORMATION PROCESSING -- Computer Applications); 46.1 (INSTRUMENTATION -- Measurement)
JAPIO KEYWORD:R011 (LIQUID CRYSTALS)

ABSTRACT

PROBLEM TO BE SOLVED: To improve apparent operating speed and to improve the error in slant-line processing by obtaining the occupying rate of the measure for every measure, wherein a figure under process is present, holding the occupying-rate data, wherein a graphic developing curve is generated in a certain constant range, and reading the data.

SOLUTION: A photomask 201 is mounted on a XY.theta. table 202. The pattern formed on the photomask 201 is irradiated by a light source 203. The image of the pattern connected to a photodiode array 205 undergoes photoelectric conversion by the photodiode array 205 and undergoes A/D conversion by a sensor circuit 206. The measured-pattern data outputted from the sensor circuit 206 are sent into a comparing circuit 208 together with the data indicating the position of the **photomask** 201 on the XY.theta. **table** 202 outputted from the position circuit. The pattern design data are stored in a magnetic disk 209 and read out into a data developing circuit 211. The comparing circuit 208 compares the measured pattern data and the design data.

8/5/9 (Item 9 from file: 347)

DIALOG(R)File 347:JAPIO

05596116 **Image available**
METHOD AND DEVICE FOR INSPECTION OF FOREIGN MATTER

PUB. NO.: 09-210916 [JP 9210916 A]
PUBLISHED: August 15, 1997 (19970815)
INVENTOR(s): HAYANO FUMITOMO
APPLICANT(s): NIKON CORP [000411] (A Japanese Company or Corporation), JP (Japan)
APPL. NO.: 08-045408 [JP 9645408]
FILED: February 06, 1996 (19960206)
INTL CLASS: [6] G01N-021/88
JAPIO CLASS: 46.2 (INSTRUMENTATION -- Testing); 42.2 (ELECTRONICS -- Solid State Components)

ABSTRACT

PROBLEM TO BE SOLVED: To **inspect** matter inspection suck as a mask or **reticle** in the optimum position by rotating the mask or reticle using a rotating means, and changing the relative position to the scanning direction of a beam of light.

SOLUTION: A foreign matter inspection device 21 is equipped with a rotary table 22 and a drive part 23, and the table 22 is rotated in the X-Y plane in the condition that a **reticle** 2 is placed thereon. The **table** 22 and drive part 23 are placed on a placing table 4 capable of moving in the Y-direction and coupled together by engagement of threads formed on the shaft 23A of the drive part with threaded grooves. The rotational amount of the table 22 and the number of revolutions are calculated by a rotational amount deciding device 24. The device 24 gives a drive signal to the drive part 23 so as to drive the shaft 23A, and the table 22 is rotated so that the reticle 2 is positioned at the decided angle. Then the placing table 4 is driven by the drive part 5 in the Y-direction while the inspection device 21 scans the surface of the reticle 2 with a scanning beam, and the inspection of the specified region is conducted.

8/5/11 (Item 11 from file: 347)

DIALOG(R)File 347:JAPIO

04334659 **Image available**
RETICLE CONTROL SYSTEM

PUB. NO.: 05-326359 [JP 5326359 A]
PUBLISHED: December 10, 1993 (19931210)
INVENTOR(s): HARAGUCHI HIROSHI
YOSHIDA YASUHISA
AOYAMA MASAHARU
FURUGUCHI SHIGEO
MISAWA HIROTO
APPLICANT(s): TOSHIBA CORP [000307] (A Japanese Company or Corporation), JP (Japan)
APPL. NO.: 04-302184 [JP 92302184]
FILED: November 12, 1992 (19921112)
INTL CLASS: [5] H01L-021/027; G03F-001/08; **G06F-015/46** ; H01L-021/02
JAPIO CLASS: 42.2 (ELECTRONICS -- Solid State Components); 29.1 (PRECISION INSTRUMENTS -- Photography & Cinematography); 45.4 (INFORMATION PROCESSING -- Computer Applications)
JAPIO KEYWORD: R107 (INFORMATION PROCESSING -- OCR & OMR Optical Readers)
JOURNAL: Section: E, Section No. 1520, Vol. 18, No. 141, Pg. 29, March 09, 1994 (19940309)

ABSTRACT

PURPOSE: To eliminate a trouble regarding a reticle in a manufacturing process, to restrain a drop in the yield of the title system and to enhance the productivity of the title system by a method wherein the reticle is controlled surely.

CONSTITUTION: The system is constituted in the following manner: the bar code of control discrimination information which is given to a reticle which is used in a stepper 1, a **reticle** housing device 2 and a **reticle cleaning** device 2 is read out by means of a bar-code reader; the information which has been read out is transferred to a host computer 7 via a master controller 5 and a block computer 6; and the state and the treatment situation of the reticle are controlled in a concentrated manner on the basis of the information which has been transferred.

8/5/28 (Item 4 from file: 350)

DIALOG(R)File 350:Derwent WPIX

014419547 **Image available**
WPI Acc No: 2002-240250/200229

XRPX Acc No: N02-185414
Reticle management **system that provides data storage and retrieval of data associated with each reticle and of movement and storage of reticles and their carriers**
Patent Assignee: PRI AUTOMATION INC (PRIA-N); MARIANO T (MARI-I); WIESLER O (WIES-I)
Inventor: MARIANO T; WIESLER O
Number of Countries: 095 Number of Patents: 003
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200182055	A1	20011101	WO 2001US13349	A	20010425	200229	B
US 20010047222	A1	20011129	US 2000199453	P	20000425	200229	
			US 2001842370	A	20010425		
AU 200159151	A	20011107	AU 200159151	A	20010425	200229	

Priority Applications (No Type Date): US 2000199453 P 20000425; US 2001842370 A 20010425
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200182055	A1	E	39	G06F-007/00	

Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW

US 20010047222 A1		G06F-017/00	Provisional application US 2000199453
AU 200159151	A	G06F-007/00	Based on patent WO 200182055

Abstract (Basic): WO 200182055 A1
NOVELTY - Bays (101-107) each has a stocker (102,104,106,108) that contains lithographic reticles or semiconductor wafers and one or more processing stations (120-126,128-134,136-142,144-150) for processing the wafers. The bays are linked by a transport system (110) for the automatic transport of the wafers between the bays with the transport system and the processing stations.
DETAILED DESCRIPTION - AN INDEPENDENT CLAIM is included for a data managing apparatus.
USE - **Management** of **reticles** .
ADVANTAGE - Allowing user to access current data corresponding to various reticles.
DESCRIPTION OF DRAWING(S) - The drawing shows a wafer processing facility
Bays (101,103,105,107)
Stockers (102,104,106,108)
Processing stations (120-150)
Transport system (110)
pp; 39 DwgNo 1/6
Title Terms: RETICLE; MANAGEMENT; SYSTEM; DATA; STORAGE; RETRIEVAL; DATA; ASSOCIATE; RETICLE; MOVEMENT; STORAGE; RETICLE; CARRY
Derwent Class: T01; U11
International Patent Class (Main): **G06F-007/00** ; **G06F-017/00**
File Segment: EPI

8/5/31 (Item 7 from file: 350)
DIALOG(R)File 350:Derwent WPIX

013579205 **Image available**
WPI Acc No: 2001-063412/200108
XRPX Acc No: N01-047728
Automated inspection of photomasks uses modified data set that removes sub-groundrule features before comparison with mask
Patent Assignee: INFINEON TECHNOLOGIES NORTH AMERICA CORP (INFN); INFINEON TECHNOLOGIES AG (INFN)
Inventor: SCHULZE S

Number of Countries: 030 Number of Patents: 006
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 1031876	A2	20000830	EP 2000102529	A	20000207	200108	B
CN 1266281	A	20000913	CN 2000104860	A	20000224	200108	
JP 2000250198	A	20000914	JP 200047853	A	20000224	200108	
KR 2000058182	A	20000925	KR 20009118	A	20000224	200122	
US 6363296	B1	20020326	US 99256930	A	19990224	200226	
TW 461000	A	20011021	TW 2000102940	A	20000221	200248	

Priority Applications (No Type Date): US 99256930 A 19990224
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 1031876	A2	E	13	G03F-001/00	
	Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI				
CN 1266281	A			H01L-021/66	
JP 2000250198	A		8	G03F-001/08	
KR 2000058182	A			H01L-021/66	
US 6363296	B1			G06F-007/66	
TW 461000	A			H01L-021/66	

Abstract (Basic): EP 1031876 A2

NOVELTY - The photomask inspection system has a light source (102) directing light onto a **photomask** (103) that is being **inspected** . Sensors (106) measure the intensity of the reflected and transmitted light. The intensity data from the light is compared (108) to a data set (112). This data set is obtained by processing the design data set (113). The processing removes sub-groundrule features by biasing adjacent features to merge into these features. This prevents the features from creating defects.

USE - Automated defect inspection for photomasks.

ADVANTAGE - By removing sub-groundrule features from the data set the **photomask** can be reliably defect **inspected** .

DESCRIPTION OF DRAWING(S) - Photomask inspection

Source light (102)

Mask (104)

sensors (106)

Comparison data set (112)

Original mask data set (113)

pp; 13 DwgNo 5/10

Title Terms: AUTOMATIC; INSPECT; PHOTOMASK; MODIFIED; DATA; SET; REMOVE; SUB; FEATURE; COMPARE; MASK
Derwent Class: P84; S03; U11
International Patent Class (Main): G03F-001/00; G03F-001/08; **G06F-007/66** ; H01L-021/66
International Patent Class (Additional): G01N-021/88; G01N-021/956; H01L-021/027
File Segment: EPI; EngPI

8/5/34 (Item 10 from file: 350)
DIALOG(R)File 350:Derwent WPIX

012076525 **Image available**
WPI Acc No: 1998-493436/199842
Computer-aided management **system for** reticle **NoAbstract**
Patent Assignee: SAMSUNG ELECTRONICS CO LTD (SMSU)
Inventor: HEO S; KIM H; HUH S W; KIM H G
Number of Countries: 001 Number of Patents: 002
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
KR 97066943	A	19971013	KR 966510	A	19960312	199842	B
KR 190026	B1	19990601	KR 966510	A	19960312	200056	

Priority Applications (No Type Date): KR 966510 A 19960312
Patent Details:

Patent No Kind Lan Pg   Main IPC   Filing Notes
KR 97066943   A   G06F-017/30
KR 190026   B1   G06F-017/30
Title Terms: COMPUTER; AID; MANAGEMENT; SYSTEM; RETICLE; NOABSTRACT
Derwent Class: T01
International Patent Class (Main): **G06F-017/30**
File Segment: EPI

8/5/37 (Item 13 from file: 350)
DIALOG(R)File 350:Derwent WPIX

011212398 **Image available**
WPI Acc No: 1997-190323/199717
XRPX Acc No: N97-157323
Photo mask management **system used in semiconductor mfg process - delivers** reticle **mutually between** reticle **storehouse and inspection appts which** inspects **presence of foreign material on each** reticle
Patent Assignee: HITACHI LTD (HITA)
Number of Countries: 001 Number of Patents: 001
Patent Family:
Patent No Kind Date Applicat No Kind Date Week
JP 9051028 A 19970218 JP 95222577 A 19950808 199717 B

Priority Applications (No Type Date): JP 95222577 A 19950808
Patent Details:
Patent No Kind Lan Pg Main IPC Filing Notes
JP 9051028 A 8 H01L-021/68

Abstract (Basic): JP 9051028 A
The system has a storehouse (11) which stores a reticle (1), based on recognition code marked on each **reticle** . A foreign material inspection appts (20) **inspects** foreign material on each **reticle** and outputs inspection result.
A delivery appts (35) delivers the reticle mutually between the storehouse and inspection appts through a passage (36). A controller (40) controls the overall set-up.
ADVANTAGE - Raises inspection precision. Improves mfg yield and productivity.
Dwg.1/5
Title Terms: PHOTO; MASK; MANAGEMENT; SYSTEM; SEMICONDUCTOR; MANUFACTURE; PROCESS; DELIVER; RETICLE; MUTUAL; RETICLE; STORAGE; INSPECT; APPARATUS; INSPECT; PRESENCE; FOREIGN; MATERIAL; RETICLE
Derwent Class: P84; T06; U11
International Patent Class (Main): H01L-021/68
International Patent Class (Additional): G03F-001/08; G05B-019/418; H01L-021/027; H01L-021/66
File Segment: EPI; EngPI

8/5/44 (Item 20 from file: 350)
DIALOG(R)File 350:Derwent WPIX

008678172
WPI Acc No: 1991-182192/199125
XRPX Acc No: N91-139516
Management **of** photomask **layout data for semiconductor IC - displays each of layout data read-out from file NoAbstract Dwg 0/2**
Patent Assignee: MATSUSHITA ELEC IND CO LTD (MATU)
Number of Countries: 001 Number of Patents: 001
Patent Family:
Patent No Kind Date Applicat No Kind Date Week
JP 3110857 A 19910510 JP 89248159 A 19890926 199125 B

Priority Applications (No Type Date): JP 89248159 A 19890926
Title Terms: MANAGEMENT; PHOTOMASK; LAYOUT; DATA; SEMICONDUCTOR; IC;

DISPLAY; LAYOUT; DATA; READ-OUT; FILE; NOABSTRACT
Derwent Class: P84; T01; U11
International Patent Class (Additional): G03F-001/08; **G06F-015/60** ;
H01L-021/82
File Segment: EPI; EngPI

8/5/48 (Item 24 from file: 350)
DIALOG(R)File 350:Derwent WPIX

004180836
WPI Acc No: 1985-007716/198502
XRPX Acc No: N85-005378
Photomask reticle inspection for semiconductor device fabrication - comparing pattern information from data base with several patterns of same shape
Patent Assignee: FUJITSU LTD (FUIT)
Inventor: KOBAYASHI K; MATSUI S
Number of Countries: 006 Number of Patents: 006
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 129751	A	19850102	EP 84106502	A	19840607	198502	B
JP 60005522	A	19850112	JP 83113230	A	19830623	198508	
EP 129751	B	19881117				198846	
DE 3475226	G	19881222				198901	
KR 8903904	B	19891010				199040	
US 5125040	A	19920623	US 84620089	A	19840613	199228	
			US 86880092	A	19860603		
			US 87139148	A	19871224		
			US 89309036	A	19890213		
			US 90587557	A	19900924		

Priority Applications (No Type Date): JP 83113230 A 19830623
Cited Patents: 1.Jnl.Ref; A3...8537; GB 2129547; No-SR.Pub; GB 129547
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 129751	A	E	17		
Designated States (Regional): DE FR GB					
EP 129751	B	E			
Designated States (Regional): DE FR GB					
US 5125040	A		8	G06K-009/68	Cont of application US 84620089
					Cont of application US 86880092
					Cont of application US 87139148
					Cont of application US 89309036

Abstract (Basic): EP 129751 A
In a reticle pattern, two sections (21,22) are identical. Database inspection is first applied to one section (21) with the other section (P-Q) excluded. A camera scans the reticle mounted on the X-Y stage with its output being then shaped in the circuit before being applied to the first input of comparator. A second comparator input is received from a data store unit after processing in the wave shaping unit. The third input is from a control unit.
When the first pattern (21), has been database inspected, and a accepted as correct, then a pattern-comparing inspection is adopted to compare the previously excluded pattern (22) with the approved pattern (21). The system sections identical areas of a **reticle** pattern and combines **database** and pattern-comparing inspection.
ADVANTAGE - Inspection time taken, and amount of data which has to be stored, is reduced.
3/5
Title Terms: PHOTOMASK; RETICLE; INSPECT; SEMICONDUCTOR; DEVICE; FABRICATE; COMPARE; PATTERN; INFORMATION; DATA; BASE; PATTERN; SHAPE
Derwent Class: S03; U11
International Patent Class (Main): G06K-009/68
International Patent Class (Additional): G01N-021/88; H01L-021/30
File Segment: EPI

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File 348:EUROPEAN PATENTS 1978-2003/Jul W03
         (c) 2003 European Patent Office
File 349:PCT FULLTEXT 1979-2002/UB=20030724,UT=20030717
         (c) 2003 WIPO/Univentio

Set     Items   Description
S1       7086   RETICLE? ? OR PHOTOMASK? ? OR PHOTO()MASK? ?
S2        121   S1(5N)(DATABASE? ? OR DATA()BASE? ? OR DBM OR DBMS OR RDBM
                OR RDBMS OR REPOSITOR??? OR DIRECTORY OR DIRECTORIES OR DATA(-
                )STORE? ? OR SERVER? ? OR TABLE? ? OR LIST????)
S3        218   S1(10N)(INSPECT?? OR CLEAN????) OR BARE(1W)S1 OR (KITTED OR
                PREKITTED)(1W)S1
S4         56   S1(3N)(MANAG??? OR MANAGEMENT OR INVENTOR??? OR TRACK???)
S5         14   S2:S4 AND IC=G06F
```

5/5,K/1 (Item 1 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS

01461895
DATA MANAGEMENT **METHOD FOR** RETICLE **/MASK WRITING**
PROCEDE DE GESTION DE DONNEES POUR L'ECRITURE DE RETICULE/MASQUE
PATENT ASSIGNEE:
Mentor Graphics Corporation, (796274), 8005 S.W. Boeckman Road, Wilsonville, Oregon 97070-7777, (US), (Applicant designated States: all)
INVENTOR:
LACOUR, Patrick, J., 2112 Fleming Drive, McKinney, TX 75070, (US)
SAHOURIA, Emile, 1632 Willow Lake Lane, San Jose, CA 95131, (US)
YOU, Siqiong, 6420 El Paseo Drive, San Jose, CA 95120, (US)
PATENT (CC, No, Kind, Date): WO 2002065312 020822
APPLICATION (CC, No, Date): EP 2001944636 010525; WO 2001US40818 010525
PRIORITY (CC, No, Date): US 781128 010209
DESIGNATED STATES: AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI; LU; MC; NL; PT; SE; TR
EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI
INTERNATIONAL PATENT CLASS: **G06F-015/00**
LEGAL STATUS (Type, Pub Date, Kind, Text):
Application: 021016 A1 International application. (Art. 158(1))
Application: 021016 A1 International application entering European phase
LANGUAGE (Publication,Procedural,Application): English; English; English

DATA MANAGEMENT **METHOD FOR** RETICLE **/MASK WRITING**
INTERNATIONAL PATENT CLASS: **G06F-015/00**

5/5,K/2 (Item 2 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS

01391932
PRODUCTION STATE PRESENTING SYSTEM
SYSTEM FUR DAS ZEIGEN DES PRODUKTIONSZUSTANDS
SYSTEME DE PRESENTATION DE L'ETAT DE PRODUCTION
PATENT ASSIGNEE:
DAI NIPPON PRINTING CO., LTD., (2113191), 1-1, Ichigaya-Kagacho 1-Chome, Shinjuku-Ku, Tokyo 162-0062, (JP), (Applicant designated States: all)
INVENTOR:
KANATANI, Keisuke, C/O DAI NIPPON PRINTING CO. LTD, 1-1, Ichigaya-Kagacho 1-Chome, 3Shinjuku-Ku, Tokyo 162-0062, (JP)
USUI, Michiro, C/O DAI NIPPON PRINTING CO., LTD, 1-1, Ichigaya-Kagacho 1-Chome, Shinjuku-Ku, Tokyo 162-0062, (JP)
MINAMI, Yoshinobu, C/O DAI NIPPON PRINTING CO. LTD, 1-1, Ichigaya-Kagacho 1-Chome, Shinjuku-Ku, Tokyo 162-0062, (JP)
LEGAL REPRESENTATIVE:
VOSSIUS & PARTNER (100314), Siebertstrasse 4, 81675 Munchen, (DE)
PATENT (CC, No, Kind, Date): EP 1291795 A1 030312 (Basic)
WO 2001095180 011213
APPLICATION (CC, No, Date): EP 2001930101 010514; WO 2001JP3980 010514
PRIORITY (CC, No, Date): JP 2000172327 000608
DESIGNATED STATES: AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI; LU; MC; NL; PT; SE; TR
EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI
INTERNATIONAL PATENT CLASS: **G06F-017/60**
CITED PATENTS (WO A): JP 10285283 A ; WO 9815908 A1; JP 8137961 A ; EP 845749 A2

ABSTRACT EP 1291795 A1
In the manufacturing status indicating system according to the present invention, an order receiving control system, a manufacture control system, and a process control system are built up by a host system (10),

a network (20), and information terminals (30), and data relating to photomasks inputted by these systems are sent to the host system (10). The host system (10) coordinates and summarizes these data and turns the data to database for each purchaser and for each order number and registers the data in DB (12). Based on DB (12), a server (11) prepares a home page to be offered to a browser device (5) on the purchaser side. When access is made from the browser device (5) on the purchaser side using an authorization key, the home page is offered. When this manufacturing status indicating system is applied to the manufacture of photomasks, various types of information relating to the manufacture of photomasks are offered to the purchasers at all times and at real time. This makes it possible to contribute to higher efficiency of the manufacture of photomasks and to more efficient production of semiconductor devices on the purchaser side.

ABSTRACT WORD COUNT: 193

NOTE:

Figure number on first page: 1

LEGAL STATUS (Type, Pub Date, Kind, Text):

Application:	020213	A1	International application. (Art. 158(1))
Application:	020213	A1	International application entering European phase
Application:	030312	A1	Published application with search report
Examination:	030312	A1	Date of request for examination: 20020215

LANGUAGE (Publication,Procedural,Application): English; English; Japanese

FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200311	120
SPEC A	(English)	200311	8431
Total word count - document A			8551
Total word count - document B			0
Total word count - documents A + B			8551

INTERNATIONAL PATENT CLASS: **G06F-017/60**

...SPECIFICATION photomask current status information", or "photomask shipping information" is selected.

Fig. 4 is a table showing a page to indicate delivery time information of the **photomask** .

Fig. 5 is a **table** showing an example of a page to indicate information of current in-process work in the manufacture of **photomask** ;

Fig. 6 is a **table** showing an example of a page to indicate detailed current status information of the **photomask** ;

Fig. 7 is a **table** showing an example of a page to indicate shipping information of the photomask; and

Fig. 8 shows an example of a page to indicate mailing...photomask. This is a process called "comparison". Because this process is widely known, detailed description is not given here.

For "dimension", description has already given.

" **Cleaning** " is a process to **clean** up the produced **photomask** . "Pellicle mounting" is a process to mount pellicle. "Pellicle visual inspection" is a process to inspect whether or not dust or foreign particles are not...

...after the pellicle mounting. "PD" is also a process to inspect whether there is dust or not. Basically, it is practiced to attach an inspection **table** of the **photomask** when the **photomask** is shipped, i.e. a **table** indicating whether glass substrate has defect or not, or whether product name is correct or not. This is a process to check whether the inspection **table** is attached to the **photomask** or not. "Shipping inspection" is a process to **inspect** whether there is abnormality in packing, or whether the product name indicated on the packing complies with product name of the photomask packed therein. When...even in case of increased production. According to the conventional method, it is not possible to determine the exposure condition only after checking the inspection **table** attached to the delivered **photomasks** .

In contrast, if it is designed in such manner that the coordinate

values and the dimensions of each part of the circuit pattern measured in ...

5/5,K/3 (Item 3 from file: 348)

DIALOG(R)File 348:EUROPEAN PATENTS
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01375230
RETICLE MANAGEMENT **SYSTEM**
SYSTEME DE GESTION DE RETICULES
PATENT ASSIGNEE:
Pri Automation, Inc., (2272440), 805 Middlesex Turnpike, Billerica, MA 01821-3986, (US), (Applicant designated States: all)
INVENTOR:
WIESLER, Oren, 7 York Road, Wayland, MA 01778, (US)
MARIANO, Thomas, 9 East Woodbine Drive, Londonderry, NH 03053, (US)
PATENT (CC, No, Kind, Date): WO 2001082055 011101
APPLICATION (CC, No, Date): EP 2001932640 010425; WO 2001US13349 010425
PRIORITY (CC, No, Date): US 199453 P 000425
DESIGNATED STATES: AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI; LU; MC; NL; PT; SE; TR
EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI
INTERNATIONAL PATENT CLASS: **G06F-007/00**
CITED PATENTS (WO A): US 6078188 A ; US 6099598 A ; US 6188935 B1
LEGAL STATUS (Type, Pub Date, Kind, Text):
Application: 020102 A1 International application. (Art. 158(1))
Application: 020102 A1 International application entering European phase
Application: 030709 A1 International application. (Art. 158(1))
Appl Changed: 030709 A1 International application not entering European phase
Withdrawal: 030709 A1 Date application deemed withdrawn: 20021126
LANGUAGE (Publication,Procedural,Application): English; English; English

RETICLE MANAGEMENT **SYSTEM**
INTERNATIONAL PATENT CLASS: **G06F-007/00**

5/5,K/4 (Item 4 from file: 348)

DIALOG(R)File 348:EUROPEAN PATENTS
(c) 2003 European Patent Office. All rts. reserv.

01291801
CAD Data compressing method and apparatus thereof
CAD-Datenkompressionsvorrichtung und -verfahren
Appareil et procede de compression de donnees d'images CAO
PATENT ASSIGNEE:
NEC CORPORATION, (236690), 7-1, Shiba 5-chome, Minato-ku, Tokyo, (JP), (Applicant designated States: all)
INVENTOR:
Shiba, Hisashi, NEC Corporation, 7-1, Shiba 5-chome, Minato-ku, Tokyo, (JP)
LEGAL REPRESENTATIVE:
Baronetzky, Klaus, Dipl.-Ing. et al (57481), Splanemann Reitzner Baronetzky Westendorp Patentanwalte Rumfordstrasse 7, 80469 Munchen, (DE)
PATENT (CC, No, Kind, Date): EP 1109133 A2 010620 (Basic)
EP 1109133 A3 030129
APPLICATION (CC, No, Date): EP 2000126402 001205;
PRIORITY (CC, No, Date): JP 99356120 991215
DESIGNATED STATES: AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI; LU; MC; NL; PT; SE; TR
EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI
INTERNATIONAL PATENT CLASS: G06T-009/00; **G06F-017/50**

ABSTRACT EP 1109133 A2

A CAD data compressing method is disclosed, that comprises the steps of generating a component figure list, and generating data of a plurality of pattern groups each containing a pointer to a component figure of the component figure list.

ABSTRACT WORD COUNT: 40

NOTE:
Figure number on first page: 1

LEGAL STATUS (Type, Pub Date, Kind, Text):

Application:	010620	A2	Published application without search report
Change:	030129	A2	International Patent Classification changed: 20021211
Search Report:	030129	A3	Separate publication of the search report
Examination:	030305	A2	Date of request for examination: 20021227
Examination:	030618	A2	Date of dispatch of the first examination report: 20030430

LANGUAGE (Publication,Procedural,Application): English; English; English

FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200125	1989
SPEC A	(English)	200125	6156
Total word count - document A			8145
Total word count - document B			0
Total word count - documents A + B			8145

...INTERNATIONAL PATENT CLASS: **G06F-017/50**

...SPECIFICATION Therefore, in addition to drawing a pattern, it takes a long time to prepare the drawing operation. Moreover, when defects of a mask and a **reticle** are **inspected** , such CAD data should be handled. Thus, the inspection time tends to become long. Consequently, the data amount of CAD data should be further reduced...

5/5,K/5 (Item 5 from file: 348)

DIALOG(R)File 348:EUROPEAN PATENTS

00888170

PROCESS CONTROL SYSTEM

PROZESSSTEUERUNGSSYSTEM

SYSTEME DE COMMANDE DE PROCESSUS

PATENT ASSIGNEE:

Hitachi, Ltd., (204141), 6, Kanda Surugadai 4-chome, Chiyoda-ku, Tokyo 101, (JP), (applicant designated states: DE;GB)

HITACHI INSTRUMENTS ENGINEERING CO., LTD., (800394), 832-2, Nagakubo, Horiguchi, Katsuta-shi, Ibaraki-ken, (JP), (applicant designated states: DE;GB)

INVENTOR:

MIZUNO, Fumio, 5066 63-2-203, Yamaguchi, Tokorozawa-shi, Saitama 359, (JP)

ISOGAI, Seiji, 2525-146, Mawatari, Hitachinaka-shi, Ibaraki 312, (JP)

WATANABE, Kenji, 38-3, Komaki-cho 3-chome, Oume-shi, Tokyo 198, (JP)

YOSHITAKE, Yasuhiro, 3-10, Nishiuraga-cho 3-chome, Yokosuka-shi, Kanagawa 239, (JP)

ASAKAWA, Terushige, Sanhaitsu 101, 1-12, Hanehigashi 1-chome, Hamura-shi, Tokyo 205, (JP)

OHYAMA, Yuichi, 652-24, Naganuma-machi, Isezaki-shi, Gunma 372, (JP)

SUGIMOTO, Hidekuni, 15-1, Midori 2-chome, Honjyo-shi, Saitama 367, (JP)

ISHIKAWA, Seiji, 420-504, Noboritoshinmachi, Tama-ku, Kawasaki-shi, Kanagawa 214, (JP)

SHIBA, Masataka, 2-1-5-602, Ryokuen 4-chome, Izumi-ku, Yokohama-shi, Kanagawa 245, (JP)

NAKAZATO, Jun, 7-9-501, Kitashinagawa 5-chome, Shinagawa-ku, Tokyo 141, (JP)

ARIGA, Makoto, 2769-6, Izumi-cho, Izumi-ku, Yokohama-shi, Kanagawa 245, (JP)

YOKOUCHI, Tetsuji, Mitake-ryo, 1545, Yoshida-cho, Totsuka-ku,

Yokohama-shi, Kanagawa 244, (JP)
HAMADA, Toshimitsu, 66-14, Torigaoka, Totsuka-ku, Yokohama-shi, Kanagawa 244, (JP)
SUZUKI, Ikuo, 1235-2, Ichige, Hitachinaka-shi, Ibaraki 312, (JP)
IKOTA, Masami, 1881-10, Mukouhara 1-chome, Higashiyamato-shi, Tokyo 207, (JP)
NOZOE, Mari, Kurefoto kabe 103, 2-27, Kabemachi 7-chome, Oume-shi, Tokyo 198, (JP)
MIYAZAKI, Isao, 1331-3, Higashikaminomiyamachi, Isesaki-shi, Gunma 372, (JP)
SHIGYO, Yoshiharu, 193-4, Namiemachi, Takasaki-shi, Gunma 370, (JP)
LEGAL REPRESENTATIVE:
Strehl Schubel-Hopf & Partner (100941), Maximilianstrasse 54, 80538 Munchen, (DE)
PATENT (CC, No, Kind, Date): EP 910123 A1 990421 (Basic)
WO 9735337 970925
APPLICATION (CC, No, Date): EP 97907383 970319; WO 97JP898 970319
PRIORITY (CC, No, Date): JP 9663014 960319; JP 9663013 960319; JP 9663012 960319
DESIGNATED STATES: DE; GB
INTERNATIONAL PATENT CLASS: H01L-021/66; G01B-011/30; G01N-021/88; **G06F-015/00** ; H04K-001/00; G09C-001/00

ABSTRACT EP 910123 A1
A process management system in accordance with the present invention comprising inspection apparatuses for inspecting defects on a wafer, the inspection apparatuses being connected through a communication network, inspection information and image information obtained from these inspection apparatuses being collected to construct a data base and an image file, therein definition of defects is given by combinations of elements which characterize the defect based on the inspection information and the image information obtained from the inspection apparatuses.
By giving definition of the defect, characteristics of the defect can be subdivided and known. Therefore, it is easy to study what cause a defect is produced by.
ABSTRACT WORD COUNT: 106

LEGAL STATUS (Type, Pub Date, Kind, Text):

Search Report:	000823 A1	Date of drawing up and dispatch of supplementary:search report 20000706
Application:	971210 A1	International application (Art. 158(1))
Application:	990421 A1	Published application (A1with Search Report ;A2without Search Report)
Examination:	990421 A1	Date of filing of request for examination: 981015

LANGUAGE (Publication,Procedural,Application): English; English; Japanese
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	9916	1524
SPEC A	(English)	9916	15815
Total word count - document A			17339
Total word count - document B			0
Total word count - documents A + B			17339

...INTERNATIONAL PATENT CLASS: **G06F-015/00**
...SPECIFICATION repetitive defect produced at pattern forming by light exposure (at reticle pattern transferring to the wafer). Therefore, it becomes easy to perform feed-back to **cleaning** of the **reticle** and to judge the fatality of defect. This case is based on exposure field arrangement data registered as data on the kind-by-kind basis...

5/5,K/6 (Item 6 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS

00845620

METHOD FOR RANDOMLY ACCESSING STORED IMAGERY AND A FIELD INSPECTION SYSTEM EMPLOYING THE SAME

VERFAHREN FUR DEN DIREKTZUGRIFF AUF GESPEICHERTE BILDDATEN UND DAFUR GEEIGNETES FELDINSPEKTIONSSYSTEM

PROCEDE D'ACCES ALEATOIRE A DES IMAGES ENREGISTREES ET SYSTEME D'INSPECTION SUR SITE DANS LEQUEL CE PROCEDE EST UTILISE

PATENT ASSIGNEE:
Peninsular Technologies, LLC, (2799470), 555 Ada Drive, SE, Ada, MI 49301, (US), (Proprietor designated states: all)
INVENTOR:
VAN DEN BOSCH, Jeffrey, A., 6665 Burger S.E., Grand Rapids, MI 49546, (US)
LEGAL REPRESENTATIVE:
Miller, James Lionel Woolverton et al (77841), Kilburn & Strode, 20 Red Lion Street, London WC1R 4PJ, (GB)

PATENT (CC, No, Kind, Date): EP 852767 A1 980715 (Basic)
EP 852767 B1 030604
WO 97008633 970306
APPLICATION (CC, No, Date): EP 96930613 960828; WO 96US13799 960828
PRIORITY (CC, No, Date): US 2909 P 950829; US 528434 950914
DESIGNATED STATES: AT; BE; CH; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI; LU; MC; NL; PT; SE
RELATED DIVISIONAL NUMBER(S) - PN (AN):
(EP 2002079197)
INTERNATIONAL PATENT CLASS: **G06F-017/40** ; G06T-007/00; G01N-021/88
CITED PATENTS (EP B): EP 645765 A; WO 84/01212 A; WO 95/16247 A; DE 4106807 A; US 4974168 A

CITED REFERENCES (EP B):
IBAK Brochure of The Sewer Analysis System 'IKAS', dated May 1990.
ITU-T Recommendation H.262 (also published as ISO/IEC standard 13818-2), approved on 10.07.95, section D.6.
'CCTV & Inspection systems' NO DIG INTERNATIONAL vol. 5, no. 7, 01 August 1994, pages 18 - 23;

NOTE:
No A-document published by EPO
LEGAL STATUS (Type, Pub Date, Kind, Text):

Change:	030108 A1	Application number of divisional application (Article 76) changed: 20021120
Examination:	20000322 A1	Date of dispatch of the first examination report: 20000203
Grant:	030604 B1	Granted patent
Application:	970625 A1	International application (Art. 158(1))
Application:	980715 A1	Published application (A1with Search Report ;A2without Search Report)
Examination:	980715 A1	Date of filing of request for examination: 980330
Assignee:	990908 A1	Transfer of rights to new applicant: Peninsular Technologies, LLC (2799470) 555 Ada Drive, SE Ada, MI 49301 US
Search Report:	990915 A1	Date of drawing up and dispatch of supplementary:search report 19990803
Change:	990915 A1	International Patent Classification changed: 19990729
Change:	990915 A1	International Patent Classification changed: 19990729

LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS B	(English)	200323	778
CLAIMS B	(German)	200323	745
CLAIMS B	(French)	200323	877
SPEC B	(English)	200323	4737
Total word count - document A			0
Total word count - document B			7137
Total word count - documents A + B			7137

INTERNATIONAL PATENT CLASS: **G06F-017/40** ...

...SPECIFICATION edge boundaries are compared with a reference pattern, and further analysis determines the location of boundary disagreements. A report is then generated that may include **reticle cleaning** or replacement information, defect location and defect classification including "killer defects".

SUMMARY OF THE INVENTION

Accordingly, the present invention has been made to overcome the...

5/5,K/7 (Item 7 from file: 348)

00236776

Method and device for detecting defects of patterns in microelectronic devices.

Verfahren und Vorrichtung zum Nachweis von Musterfehlern fur mikroelektronische Anordnungen.

Methode et dispositif de detection de defauts dans des configurations pour des dispositifs microelectroniques.

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PATENT (CC, No, Kind, Date): EP 230285 A2 870729 (Basic)
EP 230285 A3 891025
EP 230285 B1 911227
APPLICATION (CC, No, Date): EP 87100518 870116;
PRIORITY (CC, No, Date): JP 868391 860118; JP 86228980 860927
DESIGNATED STATES: DE; FR; NL
INTERNATIONAL PATENT CLASS: G01N-021/88; H01L-021/66; **G06F-015/70** ; G01N-023/04
CITED PATENTS (EP A): EP 57957 A; US 4503460 A; US 3843916 A
CITED REFERENCES (EP A):
PATENT ABSTRACTS OF JAPAN, vol. 6, no. 2 (P-96) 880 , 8th January 1982; & JP-A-56 126 750 (MITSUBISHI DENKI K.K.) 05-10-1981;

ABSTRACT EP 230285 A2

An inspecting method and device for inspecting an object or objects (12, 14, 90) such as photomasks having a plurality of identical patterns (23), to detect defects of the patterns, wherein the object is placed such that the patterns lie in the same plane, and an inspection mask (20, 92) having a plurality of translucent apertures (26) is placed such that the inspection mask is adjacent and parallel to the object. The inspection mask and the object are moved relative to each other whereby each aperture is positioned opposite to mutually corresponding portions (24) of the patterns. The object and inspection mask are irradiated with rays of light emitted in a direction substantially normal to the plane of relative movements thereof. The rays of light transmitted through the apertures and the object are converted into electric signals, and the electric signals associated with the corresponding portions (24) of the patterns are compared with each other, prior to obtaining the electric

signals of all of the plurality of patterns. If the electric signals of the corresponding portions of the patterns differs from each other, these portions are determined to be defective.
ABSTRACT WORD COUNT: 194

LEGAL STATUS (Type, Pub Date, Kind, Text):
Application:	870729 A2	Published application (Alwith Search Report ;A2without Search Report)
Search Report:	891025 A3	Separate publication of the European or International search report
Change:	891025 A2	Obligatory supplementary classification (change)
Examination:	900509 A2	Date of filing of request for examination: 900314
Change:	901114 A2	Representative (change)
Examination:	910605 A2	Date of despatch of first examination report: 910425
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Oppn None:	921216 B1	No opposition filed

LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS B	(English)	EPBBF1	5332
CLAIMS B	(German)	EPBBF1	2409
CLAIMS B	(French)	EPBBF1	2850
SPEC B	(English)	EPBBF1	9211
Total word count - document A			0
Total word count - document B			19802
Total word count - documents A + B			19802

...INTERNATIONAL PATENT CLASS: **G06F-015/70**

...SPECIFICATION data obtained as a result of inspection of a pattern of an actually produced reticle is compared with the reference data, whereby the pattern of **the** produced **reticle** is **inspected** for any defects. In this method, however, a **computer** used **for** the data comparison requires a memory having a large capacity, since all of the reference data must be stored in the memory. In the case where the inspection **data** representative of the **inspected reticle** pattern is temporarily stored in the memory, the required **memory capacity** is doubled. In particular, where the object to be **inspected** is masks used in x-ray photolithography, which is increasingly practiced in the industry, the lines forming a pattern are often less than one micron...

5/5,K/8 (Item 1 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

01018870 **Image available**
PHOTOLITHOGRAPHIC CRITICAL DIMENSION CONTROL USING RETICLE MEASUREMENTS
REGLAGE DE DIMENSIONS CRITIQUES EN PHOTOLITHOGRAPHIE A L'AIDE DE MESURE DE MASQUES
Patent Applicant/Assignee:
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Patent and Priority Information (Country, Number, Date):
Patent: WO 200348857 A1 20030612 (WO 0348857)
Application: WO 2002US37800 20021125 (PCT/WO US0237800)
Priority Application: US 2001997904 20011130

Designated States: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG UZ VN YU ZA ZM ZW
(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR IE IT LU MC NL PT SE SK TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Main International Patent Class: G03C-005/00
International Patent Class: **G06F-019/00** ; G21K-005/00; **G06F-017/50** ; G01D-018/00
Publication Language: English
Filing Language: English
Fulltext Availability:
Detailed Description
Claims
Fulltext Word Count: 3558

English Abstract
A method of implementing a new reticle for manufacturing semiconductor devices on a wafer which involves performing measurements (420) on the reticle and assigning an initial exposure dose (470) by using a predetermined algorithm (450). The exposure control system (490) utilizes reticle CD data (430, 440) for automatically calculating reticle exposure offset values, i.e. reticle factors (510). A correlation of reticle size deviations (500) to calculated reticle factors (510) is used to derive a reticle factor (510) for the new reticle. The derived reticle factor (510) is then used to predict (450) an initial exposure condition for the new reticle which is applied (470) to the lithography tool (410) for achieving a wafer design dimension.

French Abstract
L'invention porte sur un procede de mise en oeuvre d'un nouveau masque s'utilisant dans la fabrication de dispositifs semi-conducteurs consistant a effectuer des mesures (420) sur le masque, et a fournir une dose initiale d'exposition (470) a l'aide d'un algorithme (450) predetermine. Le systeme de reglage d'exposition (490) utilise des donnees de masque (430, 440) sur CD pour calculer automatiquement les decalages d'exposition du masque, c.-a-d. les facteurs de masque, ainsi qu'une correlation des deviations (500) de taille du masque avec les facteurs de masque (510) calcules, pour en tirer le facteur de masque (510) derive, du nouveau masque. On utilise alors ledit facteur de masque derive (510) pour predire (450) les conditions d'exposition initiales du nouveau masque qui seront appliquees (470) a l'outil de lithographie (410) pour obtenir les dimensions du dessin sur la tranche.
Legal Status (Type, Date, Text)
Publication 20030612 A1 With international search report.
Publication 20030612 A1 Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

International Patent Class: **G06F-019/00** ...

... **G06F-017/50**
Fulltext Availability:
Detailed Description

Detailed Description
... exposure condition, i.e. Optimum Dose, in a single pass.

Specifically, for each reticle used in production, reticle factors are calculated and stored in a **database** . For **reticles** lacking suitable recent historical wafer data on a given photolithographic tool, the calculated reticle factors are then used to arrive at an optimum exposure condition...a first run rework for production runs. Reticle dimension data, reticle factors, historical wafer exposure conditions and historical wafer dimension data, are stored in the **database** for each **reticle** . These data are used when a particular reticle is required for a

given run.

It is noted that the present invention may be used in...to reticle dimension data, reticle factors, historical wafer exposure conditions and historical wafer dimension data. The computer (460) executes all processing necessary to support required **database** access, dose and **reticle** factor calculations. The computer (Fig. 4, 460) may also be provided with an interface for sending the exposure

5/5,K/9 (Item 2 from file: 349)

00967546 **Image available**

APPARATUS AND METHODS FOR MODELING PROCESS EFFECTS AND IMAGING EFFECTS IN SCANNING ELECTRON MICROSCOPY

APPAREIL ET PROCEDES D'EFFETS DE PROCESSUS DE MODELISATION ET D'EFFETS D'IMAGERIE DANS LA MICROSCOPIE A BALAYAGE ELECTRONIQUE

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Patent and Priority Information (Country, Number, Date):
Patent: WO 2002101602 A1 20021219 (WO 02101602)
Application: WO 2002US18955 20020613 (PCT/WO US0218955)
Priority Application: US 2001881451 20010613
Designated States: JP
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
Main International Patent Class: **G06F-017/50**
Publication Language: English
Filing Language: English
Fulltext Availability:
Detailed Description
Claims
Fulltext Word Count: 7994

English Abstract
Disclosed are methods and apparatus for generating a test recipe for a metrology tool (306) is disclosed. A plurality of first reference images (308) that are designed to be used to fabricated a plurality of structures on a sample are provided. Each structure is imageable to form a plurality of target image patterns. A test recipe for use by a metrology tool (306) in locating the structures on the samples is generated or modified. Generating or modifying the test recipe includes forming a plurality of second reference images (310) from the first reference images (308) and associating the second reference images (310) with the test recipe. The second reference images (310) are formed to at least partially simulate one or more process effect(s) associated with fabricating the structures of the sample. Additionally, the second reference images (310) may also be formed to simulate one or more imaging effects.

French Abstract
La presente invention concerne des procedes et un appareil permettant de generer une procedure d'essai destinee a un instrument (306) de metrologie. On prend une pluralite de premieres images (308) de reference concues pour la fabrication d'une pluralite de structures sur un echantillon. On peut imager chaque structure de facon a former une pluralite de schemas d'image cible. On genere ou on modifie une procedure d'essai destinees a un instrument (306) de metrologie en localisant ces

structures sur les echantillons. La generation ou la modification de la procedure d'essai consiste a former une pluralite de secondes images (310) de reference a partir des premieres images (308) de reference et a associer ces secondes images (310) a la procedure d'essai. Ces secondes images (310) de reference sont formees de facon a simuler au moins partiellement un ou plusieurs effets de processus associes a la fabrication des structures de l'echantillon. En outre, les secondes images (310) de reference peuvent aussi etre formees de facon a simuler un ou plusieurs effets d'imagerie.

Legal Status (Type, Date, Text)
Publication 20021219 A1 With international search report.
Publication 20021219 A1 Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

Main International Patent Class: **G06F-017/50**
Fulltext Availability:
Detailed Description
Claims

Detailed Description
... laser scanner is used to expose a reticle pattern) a plurality of reticles that will later be used to fabricate the particular IC design. A **reticle** inspection system may then **inspect** the **reticle** for defects that may have occurred during the production of the reticles.

A reticle or photomask is an optical element containing transparent and opaque, semi...by a laser or an e-bearn direct write technique, for example, both of which are widely used in the art.

After fabrication of each **reticle** or group of **reticles** , each **reticle** is typically **inspected** by illuminating it with light emanating from a controlled illuminator. An optical image of the reticle is constructed based on the portion of the light reflected, transmitted, or otherwise directed to a light sensor. Another way to **inspect** a **reticle** is accomplished by directing a beam of electrons from a scanning electron microscope towards the reticle. An image of the reticle is constructed based on...process effects and/or imaging effects. The recipe is designed for use by a metrology tool which is configured to locate and measure and/or **inspect** structures on a particular sample, such as a **reticle** or integrated circuit (IC). The reticle or IC may contain test structures, as well as other types of structures. By way of examples, the structures...pattern on a metallization layer, and so on. Each electronic representation is composed of a plurality of polygons or other shapes, which together define the **reticle** pattern.

The circuit pattern **database** (referred to herein as design files) may be
generated using any suitable technique, for example, by using EDA or CAD tools. In one technique, the...

Claim
... the imaging effects.

11 A method as recited in claim 1, wherein the metrology tool is a scanning electron microscope designed to measure and/or **inspect** samples selected from a group consisting of a **reticle** and an integrated circuit and the structures are selected from a group consisting of integrated circuit structures, resist pattern structures utilizable for fabricating integrated circuit...imaging effects.

26 A computer system as recited in claim 18, wherein the metrology tool is a scanning electron microscope designed to measure and/or **inspect** samples selected from a group consisting of a **reticle** and an integrated circuit and the structures are selected from a group consisting of integrated circuit structures, resist pattern structures utilizable for fabricating integrated

5/5,K/10 (Item 3 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00931272 **Image available**
DATA MANAGEMENT **METHOD FOR** RETICLE **/MASK WRITING**
PROCEDE DE GESTION DE DONNEES POUR L'ECRITURE DE RETICULE/MASQUE
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Patent and Priority Information (Country, Number, Date):
Patent: WO 200265312 A1 20020822 (WO 0265312)
Application: WO 2001US40818 20010525 (PCT/WO US0140818)
Priority Application: US 2001781128 20010209
Designated States: IL JP KR
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
Main International Patent Class: **G06F-015/00**
Publication Language: English
Filing Language: English
Fulltext Availability:
Detailed Description
Claims
Fulltext Word Count: 7254

English Abstract
A method of translating device layout data to a format for a mask writing tool includes the acts of reading a file defining a number of cells that represent structures on the device (FIGURE 2A). One or more cells (28) are selected and one or more modified cells (22) based on the interaction of the selected cells with other cells in the device layout (20) are created. One or more additional cells is created that will create structures on the mask that are not formed by writing files corresponding to the modified cells and areas that prevent extraneous structures from being formed on the mask at a selected location by the writing of the files corresponding to the modified cells. A jobdeck for the mask writing tool is created that indicates where the files corresponding to modified cells and the one or more additional cells should be written to create one or more masks or reticles.

French Abstract
L'invention porte sur un procede de traduction de donnees de configuration de dispositif dans un format destine a un instrument d'ecriture de masque. Ce procede consiste a lire un fichier definissant un nombre de cellules qui representent les structures du dispositif. Une ou plusieurs cellules (28) sont choisies et une ou plusieurs cellules modifiees (22) en fonction de l'interaction des cellules choisies avec les autres cellules dans la configuration du dispositif (20) sont creees. Une ou plusieurs cellules supplementaires sont creees, lesquelles creeront des structures sur le masque qui ne sont pas formees par l'ecriture de fichiers correspondant aux cellules modifiees et des zones qui empechent les structures etrangeres de se former a un endroit precis de la surface du masque, par l'ecriture de fichiers correspondant aux cellules modifiees. Un module destine a l'instrument d'ecriture de masque est cree ; il sert a indiquer ou les fichiers correspondant aux cellules modifiees et a la/aux cellule(s) supplementaire(s) devraient etre ecrits afin de creer un ou plusieurs masques ou reticules.

Legal Status (Type, Date, Text)
Publication 20020822 A1 With international search report.

Examination 20030116 Request for preliminary examination prior to end of 19th month from priority date
DATA MANAGEMENT **METHOD FOR** RETICLE **/MASK WRITING**
Main International Patent Class: **G06F-015/00**
Fulltext Availability:
Detailed Description

Detailed Description
DATA **MANAGEMENT** METHOD FOR **RETICLE** /MASK WRITING
Field of the Invention
The present invention relates to photolithographic patterning, such as methods for creating photolithographic masks or reticles, and in particular...

5/5,K/11 (Item 4 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00908017 **Image available**
DIGITAL MEDIA RECOGNITION APPARATUS AND METHODS
APPAREIL ET PROCEDES DE RECONNAISSANCE DE SUPPORTS NUMERIQUES
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Patent Applicant/Inventor:
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Legal Representative:
POSA John G (et al) (agent), Gifford, Krass, Groh, Sprinkle, Anderson, & Citkowski, PC., Suite 400, 280 N. Old Woodward Avenue, Birmingham, MI 49009, US,
Patent and Priority Information (Country, Number, Date):
Patent: WO 200241559 A2-A3 20020523 (WO 0241559)
Application: WO 2001US48020 20011113 (PCT/WO US0148020)
Priority Application: US 2000711493 20001113
Designated States: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PH PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Main International Patent Class: G06K-009/00
International Patent Class: **G06F-017/30**
Publication Language: English
Filing Language: English
Fulltext Availability:
Detailed Description
Claims
Fulltext Word Count: 43616

English Abstract
Physical objects, including still and moving images, sound/audio and text are transformed into more compact forms for identification and other purposes using a method unrelated to existing image-matching systems which rely on feature extraction. An auxiliary construct, preferably a warp grid, is associated with an object, and a series of transformations are imposed to generate a unique visual key for identification, comparison, and other operations. Search methods are also disclosed for matching an unknown image to one previously represented in a visual key

database. Broadly, a preferred search method sequentially examines candidate database images for their closeness of match in a sequential order determined by their a priori match probability.

French Abstract
Selon l'invention, des objets physiques, notamment des images fixes et mobiles, du son/audio et un texte sont transformes en formes plus compactes aux fins d'identification et pour d'autres raisons, au moyen d'un procede n'etant pas relatif aux systemes de correspondance d'image existants s'appuyant sur une extraction de caracteristiques. Une construction auxiliaire, de preference une grille de texture, est associee a un objet et une serie de transformations est executee en vue de generer une cle visuelle unique, aux fins d'identification, de comparaisons et d'autres operations. L'invention concerne egalement des procedes de recherche permettant de faire correspondre une image inconnue a une image precedemment representee dans une base de donnees de cles visuelles. Generalement, un procede de recherche prefere examine de maniere sequentielle des images candidates d'une base de donnees de maniere a determiner la proximite de correspondance dans un ordre sequentiel determine par leur probabilite de correspondance a priori. Par consequent, le candidat presentant la correspondance la plus probable est examine en premier, le candidat suivant presentant la correspondance la plus probable etant examine en deuxieme, etc. Par rapport a la reconnaissance de sequences video et d'autres trains d'informations, des principes de reconnaissance de trains holotropiques inventifs sont mis en oeuvre, les statistiques de la distribution spatiale des points de la grille de texture etant utilisees pour generer des cles d'index. Le systeme selon l'invention peut etre applique dans differents domaines, notamment l'identification et la recuperation d'informations concernant des objets gouvernementaux, scientifiques, industriels, commerciaux et recreatifs. L'invention concerne en outre des extensions de la technologie permettant d'obtenir une distribution uniforme des objets concernant la recherche de la base de donnees, une consideration etant le point central de l'echelonnabilite. Plus precisement, un procede generalise a ete elabore en fonction d'une projection de reticule, ameliorant de maniere considerable l'uniformite des distributions d'objets dans les donnees recueillies. Par consequent, alors que des criteres fondes sur des statistiques sont utilises dans certains modes de realisation pour la transformation d'une construction associee a une image, du son/audio, un texte ou d'autre representation, une projection de reticule peut etre utilisee, de facon alternative dans une transformation d'attribut conformement a d'autres modes de realisation de l'invention.

Legal Status (Type, Date, Text)
Publication 20020523 A2 Without international search report and to be republished upon receipt of that report.
Search Rpt 20020906 Late publication of international search report
Republication 20020906 A3 With international search report.
Examination 20021017 Request for preliminary examination prior to end of 19th month from priority date

International Patent Class: **G06F-017/30**
Fulltext Availability:
Detailed Description

Detailed Description
... process 1 5 which is capable of perpetuating and refining itself through the iterative applicationof its basic functional operation to the current materials in the **database** .
Reticle Projection
This method employs pseudo-random sequences to sample frames of transformed media. These pseudo-random sequences operate on the transformed data in a manner...a shift register is illustrated in Figure 59: Shift Register. The shift register has a number of taps 5201, determined by the length of the **reticle** according to the **table** below. With a **reticle** of
length 4095 (2 12

1), where n is 12, we'll use 4 taps. Note that the last position is always included as one...

...8 8fi@5@4
9 9@5
10 10@7
I 1 1159
12 12fi@491
.13 1354@3j
14 14@5@3j
15 15J4
Table of **Reticle** Tap's
The shift register is initialized to a BitArray of length n (12) containing zeros 5202; a 1 is placed in position n 5203...

5/5,K/12 (Item 5 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00870041 **Image available**
NETWORK-BASED PHOTOMASK DATA ENTRY INTERFACE AND INSTRUCTION GENERATOR FOR MANUFACTURING PHOTOMASKS
INTERFACE D'ENTREES DE DONNEES DE MASQUES DE PHOTOGRAVURE BASEE SUR RESEAU ET GENERATEUR D'INSTRUCTIONS DESTINEES A LA FABRICATION DE MASQUES DE PHOTOGRAVURE
Patent Applicant/Assignee:
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Legal Representative:
FELGER Thomas R (agent), Baker Botts L.L.P., 2001 Ross Avenue, Suite 600, Dallas, TX 75201-2980, US,
Patent and Priority Information (Country, Number, Date):
Patent: WO 200203141 A2-A3 20020110 (WO 0203141)
Application: WO 2001US21020 20010629 (PCT/WO US0121020)
Priority Application: US 2000610917 20000705
Designated States: AE AG AL AM AT (utility model) AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ (utility model) DE (utility model) DK (utility model) DM DZ EC EE (utility model) ES FI (utility model) GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK (utility model) SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Main International Patent Class: **G06F-017/30**
Publication Language: English
Filing Language: English
Fulltext Availability:
Detailed Description
Claims
Fulltext Word Count: 4715

English Abstract
A computer network for generating instructions for photomask manufacturing equipment, based on photomask specification data input by a customer. A series of order entry screens are downloaded to a remote customer's computer, typically via an internet connection. The customer is prompted to enter photomask specification data, which is delivered to computing equipment on the manufacturer's local network. The manufacturer's computing equipment validates the photomask specification data, and uses this data to generate fracturing isntructions and equipment control instructions. The fracturing instructions, together

with pattern design data from the customer, are delivered to a fracture engine, which provides fractured pattern data. The control instructions and the fractured pattern data may then be electronically delivered to the manufacturing equipment.

French Abstract
L'invention concerne un reseau informatique destine a generer des instructions pour un materiel de fabrication de masques de photogravure, sur la base de donnees de specifications de masques de photogravure entrees par un client. Une serie d'ecrans d'entrees d'ordres sont telecharges vers un ordinateur de client distant, typiquement par une connexion Internet. Le client est invite a entrer des donnees de specifications de masques de photogravure, lesquelles sont remises a un materiel informatique sur le reseau local du fabricant. Le materiel informatique du fabricant valide les donnees de specifications de masques de photogravure et il utilise ces donnees pour generer des instructions de fracture et des instructions de commande de materiel. Les instructions de fracture, de meme que les donnees de conception de motif provenant du client sont transmises a un moteur de fracture, lequel produit des donnees de motif fracture. Les instructions de commande et les donnees de motif fracture peuvent ensuite etre transmises par voie electronique au materiel de fabrication.

Legal Status (Type, Date, Text)
Publication 20020110 A2 Without international search report and to be republished upon receipt of that report.
Examination 20020516 Request for preliminary examination prior to end of 19th month from priority date
Search Rpt 20020815 Late publication of international search report
Republication 20020815 A3 With international search report.
Republication 20020815 A3 Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

Main International Patent Class: **G06F-017/30**
Fulltext Availability:
Detailed Description
Claims
Detailed Description
... s specifications.

Steps 120 - 124 of FIGURE 1B illustrate an order entry process and other processes performed by interface computer 108.

Computer 108 stores the **photomask** specification data in **photomask** specification **database** 112. This data is accessed by command generator 114, which generates instructions that are delivered to the photomask fabrication equipment. Specifically, command generator 114 generates...or subsequent to, order entry.

Step 125 occurs after Step 121. The data entered by the customer during the order entry process is stored as **photomask** specification data in **photomask** specification **database** 112.

Step 122 is receiving billing data from the customer. This step may occur during the same network connection as Step 121. In the example the customer's design data to create photomask patterns recognizable by the manufacturing equipment.

In Step 127, command generator 114 receives the **photomask** specification data from **database** 112. It uses this data to generate instructions for the manufacturing equipment. The result is a set of computer instructions that will cause the patterns...

...of the network used for order entry.

For example, a secure FTP file transfer could be used.

The design data is stored in a customer **database** 110.

Validation of **Photomask** Specification and Billing Data
As stated above, in Step 123, the customer's photomask specification data may be validated on-line, i.e., as it...

Claim
... download validation results to the customer computer; wherein the photomask specification data at least identifies layers, patterns, placements, and fracturing data for at least one **photomask** ;
a **photomask** specification **database** in communication with the interface computer, operable to store the photomask specification data;
a command generator in communication with the **photomask** specification **database** , operable to generate fracturing instructions and control instructions in response to the **photomask** specification data;
a customer design **database** that stores design data for the photomask; and
a fracture engine that receives the fracturing instructions and the design data and uses this data to...

5/5,K/13 (Item 6 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00848452 **Image available**
RETICLE MANAGEMENT **SYSTEM**
SYSTEME DE GESTION DE RETICULES
Patent Applicant/Assignee:
PRI AUTOMATION INC, 805 Middlesex Turnpike, Billerica, MA 01821-3896, US, US (Residence), US (Nationality)
Inventor(s):
WIESLER Oren, 7 York Road, Wayland, MA 01778, US,
MARIANO Thomas, 9 East Woodbine Drive, Londonderry, NH 03053, US,
Legal Representative:
HJORTH Beverly E (et al) (agent), Weingarten, Schurgin, Gagnebin & Hayes, LLP, Ten Post Office Square, Boston, MA 02109, US,
Patent and Priority Information (Country, Number, Date):
Patent: WO 200182055 A1 20011101 (WO 0182055)
Application: WO 2001US13349 20010425 (PCT/WO US0113349)
Priority Application: US 2000199453 20000425
Designated States: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Main International Patent Class: **G06F-007/00**
Publication Language: English
Filing Language: English
Fulltext Availability:
Detailed Description
Claims
Fulltext Word Count: 5987

English Abstract

A **reticle management** system (100) is disclosed that provides data storage and retrieval of data associated with each reticle, reticle carrier, and certain system attributes and also for the efficient movement and storage of reticles and **reticle** carriers. The reticle **management** system includes a **reticle management** controller, a central **reticle database** , and one or more **reticle** stockers (102,104,106,108) that include a stocker controller, a stocker database, and a stocker unit.

French Abstract

L'invention concerne un systeme de gestion de reticules (100) permettant de memoriser et d'extraire des donnees associees a chaque reticule, a chaque support de reticule et a certains attributs de systeme et permettant egalement de deplacer et de memoriser efficacement des reticules et des supports de reticule. Ce systeme de gestion de reticules comporte un controleur de gestion de reticules, une base de donnees centrale de reticules et un ou plusieurs stockeurs de reticules (102,104,106,108) comportant un controleur de stockage, une base de donnees de stockage et une unite de stockage.

Legal Status (Type, Date, Text)
Publication 20011101 A1 With international search report.
Examination 20020328 Request for preliminary examination prior to end of 19th month from priority date

RETICLE MANAGEMENT **SYSTEM**

Main International Patent Class: **G06F-007/00**
Fulltext Availability:
Detailed Description
Claims

English Abstract

A **reticle management** system (100) is disclosed that provides data storage and retrieval of data associated with each reticle, reticle carrier, and certain system attributes and also for the efficient movement and storage of reticles and **reticle** carriers. The reticle **management** system includes a **reticle management** controller, a central **reticle database** , and one or more **reticle** stockers (102,104,106,108) that include a stocker controller, a stocker database, and a stocker unit.

Detailed Description

TITLE OF THE INVENTION

RETICLE MANAGEMENT SYSTEM

CROSS REFERENCE TO RELATED APPLICATIONS

This application claims priority of Provisional Application No. 60/199,453 filed April 25, 2000 entitled **RETICLE MANAGEMENT** SYSTEM and incorporated herein by reference.

5/5,K/14 (Item 7 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00573152 **Image available**
MECHANISMS FOR MAKING AND INSPECTING RETICLES
MECANISME DE FABRICATION ET D'INSPECTION DE RETICULES
Patent Applicant/Assignee:
KLA-TENCOR CORPORATION,
Inventor(s):
GLASSER Lance A,
YE Jun,
JUANG Shauh-Teh,
ALLES David S,
WILEY James N,
Patent and Priority Information (Country, Number, Date):
Patent: WO 200036525 A2 20000622 (WO 0036525)
Application: WO 99US30240 19991217 (PCT/WO US9930240)
Priority Application: US 98213744 19981217
Designated States: JP AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE
Main International Patent Class: **G06F-017/50**
International Patent Class: G03F-001/00; G03F-007/20
Publication Language: English
Fulltext Availability:
Detailed Description
Claims
Fulltext Word Count: 10056

English Abstract
A reusable circuit design (250, 300) for use with electronic design automation EDA tools in designing integrated circuits is disclosed, as well as reticle inspection and fabrication methods that are based on such reusable circuit design. The reusable circuit design (250, 300) is stored on a computer readable medium and contains an electronic representation of a layout pattern (260, 258, 302) for at least one layer of the circuit design on an integrated circuit. The layout pattern includes a flagged critical region which corresponds to a critical region (256, 304) on a reticle or integrated circuit that is susceptible to special inspection or fabrication procedures. In one aspect of the reusable circuit design, the special analysis is performed during one from a group consisting of reticle inspection, reticle production, integrated circuit fabrication, and fabricated integrated circuit inspection.

French Abstract
L'invention concerne une conception reutilisable de circuits (250, 300) destinee a etre utilisee avec des instruments d'automatisation de la conception de circuits (EDA) qui servent a concevoir des circuits integres, de meme que des procedes d'inspection et de fabrication de reticules ainsi que des procedes d'inspection et de fabrication de reticules se fondant sur cette conception reutilisable de circuits. La conception reutilisable de circuits (250, 300) est stockee sur un support lisible par ordinateur; elle contient une representation electronique d'un motif de configuration (260, 258, 302) pour au moins une couche de conception de circuit sur un circuit integre. Le motif de configuration comprend une region critique signalee avec des drapeaux qui correspond a une region critique (256, 304) sur un reticule ou un circuit integre susceptibles de necessiter des procedures d'inspection ou de fabrication speciales. Dans un aspect de cette conception reutilisable de circuits, l'analyse speciale est appliquee a l'un des processus faisant partie du groupe suivant: inspection de reticules, production de reticules, fabrication de circuits integres et inspection de circuits integres fabriques.

Main International Patent Class: **G06F-017/50**
Fulltext Availability:
Detailed Description
Claims

Detailed Description

... laser scanner is used to expose a reticle pattern) a plurality of reticles that will later be used to fabricate the particular IC design. A **reticle** inspection system may then **inspect** the **reticle** for defects that may have occurred during the production of the reticles.

A reticle or photornask is an optical element containing transparent and opaque, semi...

...by a laser or an e-beam direct write technique, for example, both of which are widely used in the art.

After fabrication of each **reticle** or group of **reticles** , each **reticle** is typically **inspected** by illuminating it with light emanating from a controlled illuminator. An optical image of the reticle is constructed based on the portion of the light...

...threshold value (for identifying defects) while other applications require less stringent, higher threshold levels. Since conventional inspections analyze all features of a given type of **reticle** with the same threshold and analysis algorithm, some features are **inspected** too stringently while other are not inspected stringently enough. For example, critical features of an integrated circuit typically include gate widths of the semiconductor transistor...and so on.

Each electronic representation is composed of a plurality of polygons or other shapes (herein, referred to as "figures"), which together define the **reticle** pattern.

The circuit pattern **database** may be generated using any suitable technique,
for example, by using EDA or CAD tools. For example, the IC designer may manually lay out the...

...In this invention, the circuit pattern database may include flagged portions of particular electronic representations that will be used to inform an inspection system to **inspect** corresponding portions of the **reticle** and/or fabricated IC device according
12
to a special inspection process. The flagged portions may also be used to inform a fabrication system to...

...the reticle and/or IC device according to a special fabrication process. Mechanisms for flagging portions of the database and using such flagged portions to **inspect** or fabricate a **reticle** or IC device are further described below.

After the circuit pattern database is generated, the circuit pattern database is used to produce a plurality of...

...as a MEBES" 4500, commercially available from ETEC of Hayward, California.

Each reticle corresponds to one or more electronic representation(s) from the circuit pattern **database** . A **reticle** is then **inspected** in operation 108, and it is determined whether the **reticle** passes inspection in operation I IO. If the reticle passes inspection, the reticle may then be used to fabricate a physical layer of the IC...

...in operation II 2. However, if the reticle does not pass inspection, the reticle is either repaired or remade in operation 114, and the new **reticle** is **inspected** in operation 108. Operations 106 through 112 are implemented for each electronic representation of the circuit pattern database.

The present invention may be implemented on...for inspecting the fabricated reticle. Alternatively, an electronic representation may include multiple different shadow representations for flagging different

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File 347:JAPIO Oct 1976-2003/Mar(Updated 030703)
         (c) 2003 JPO & JAPIO
File 350:Derwent WPIX 1963-2003/UD,UM &UP=200347
         (c) 2003  Thomson Derwent
File 348:EUROPEAN PATENTS 1978-2003/Jul W03
         (c) 2003 European Patent Office
File 349:PCT FULLTEXT 1979-2002/UB=20030724,UT=20030717
         (c) 2003 WIPO/Univentio

Set     Items   Description
S1         18   AU=(WIESLER O? OR MARIANO T?)
S2          3   S1 AND (RETICLE? ? OR PHOTOMASK? ? OR PHOTO()MASK? ?)
```

2/5/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX

014419547 **Image available**
WPI Acc No: 2002-240250/200229
XRPX Acc No: N02-185414
Reticle **management system that provides data storage and retrieval of data associated with each** reticle **and of movement and storage of** reticles **and their carriers**
Patent Assignee: PRI AUTOMATION INC (PRIA-N); MARIANO T (MARI-I); WIESLER O (WIES-I)
Inventor: **MARIANO T** ; **WIESLER O**
Number of Countries: 095 Number of Patents: 003
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200182055	A1	20011101	WO 2001US13349	A	20010425	200229	B
US 20010047222	A1	20011129	US 2000199453	P	20000425	200229	
			US 2001842370	A	20010425		
AU 200159151	A	20011107	AU 200159151	A	20010425	200229	

Priority Applications (No Type Date): US 2000199453 P 20000425; US 2001842370 A 20010425
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200182055	A1	E	39	G06F-007/00	

Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW

US 20010047222	A1		G06F-017/00	Provisional application US 2000199453
AU 200159151	A		G06F-007/00	Based on patent WO 200182055

Abstract (Basic): WO 200182055 A1
NOVELTY - Bays (101-107) each has a stocker (102,104,106,108) that contains lithographic **reticles** or semiconductor wafers and one or more processing stations (120-126,128-134,136-142,144-150) for processing the wafers. The bays are linked by a transport system (110) for the automatic transport of the wafers between the bays with the transport system and the processing stations.
DETAILED DESCRIPTION - AN INDEPENDENT CLAIM is included for a data managing apparatus.
USE - Management of **reticles** .
ADVANTAGE - Allowing user to access current data corresponding to various **reticles** .
DESCRIPTION OF DRAWING(S) - The drawing shows a wafer processing facility
Bays (101,103,105,107)
Stockers (102,104,106,108)
Processing stations (120-150)
Transport system (110)
pp; 39 DwgNo 1/6
Title Terms: **RETICLE** ; MANAGEMENT; SYSTEM; DATA; STORAGE; RETRIEVAL; DATA; ASSOCIATE; **RETICLE** ; MOVEMENT; STORAGE; **RETICLE** ; CARRY
Derwent Class: T01; U11
International Patent Class (Main): G06F-007/00; G06F-017/00
File Segment: EPI

2/5/2 (Item 1 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS

01375230
RETICLE **MANAGEMENT SYSTEM**

SYSTEME DE GESTION DE RETICULES
PATENT ASSIGNEE:
Pri Automation, Inc., (2272440), 805 Middlesex Turnpike, Billerica, MA 01821-3986, (US), (Applicant designated States: all)
INVENTOR:
WIESLER, Oren , 7 York Road, Wayland, MA 01778, (US)
MARIANO, Thomas , 9 East Woodbine Drive, Londonderry, NH 03053, (US
PATENT (CC, No, Kind, Date):
WO 2001082055 011101
APPLICATION (CC, No, Date): EP 2001932640 010425; WO 2001US13349 010425
PRIORITY (CC, No, Date): US 199453 P 000425
DESIGNATED STATES: AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI; LU; MC; NL; PT; SE; TR
EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI
INTERNATIONAL PATENT CLASS: G06F-007/00
CITED PATENTS (WO A): US 6078188 A ; US 6099598 A ; US 6188935 B1
LEGAL STATUS (Type, Pub Date, Kind, Text):
Application: 020102 A1 International application. (Art. 158(1))
Application: 020102 A1 International application entering European phase
Application: 030709 A1 International application. (Art. 158(1))
Appl Changed: 030709 A1 International application not entering European phase
Withdrawal: 030709 A1 Date application deemed withdrawn: 20021126
LANGUAGE (Publication,Procedural,Application): English; English; English

2/5/3 (Item 1 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00848452 **Image available**
RETICLE **MANAGEMENT SYSTEM**
SYSTEME DE GESTION DE RETICULES
Patent Applicant/Assignee:
PRI AUTOMATION INC, 805 Middlesex Turnpike, Billerica, MA 01821-3896, US, US (Residence), US (Nationality)
Inventor(s):
WIESLER Oren , 7 York Road, Wayland, MA 01778, US,
MARIANO Thomas , 9 East Woodbine Drive, Londonderry, NH 03053, US
Legal Representative:
HJORTH Beverly E (et al) (agent), Weingarten, Schurgin, Gagnebin & Hayes, LLP, Ten Post Office Square, Boston, MA 02109, US,
Patent and Priority Information (Country, Number, Date):
Patent: WO 200182055 A1 20011101 (WO 0182055)
Application: WO 2001US13349 20010425 (PCT/WO US0113349)
Priority Application: US 2000199453 20000425
Designated States: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Main International Patent Class: G06F-007/00
Publication Language: English
Filing Language: English
Fulltext Availability:
Detailed Description
Claims
Fulltext Word Count: 5987

English Abstract
A **reticle** management system (100) is disclosed that provides data storage and retrieval of data associated with each **reticle** , **reticle** carrier, and certain system attributes and also for the efficient movement and storage of **reticles** and **reticle** carriers. The **reticle**

management system includes a **reticle** management controller, a central **reticle** database, and one or more **reticle** stockers (102,104,106,108) that include a stocker controller, a stocker database, and a stocker unit.

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File 275:Gale Group Computer DB(TM) 1983-2003/Jul 25
         (c) 2003 The Gale Group
File 621:Gale Group New Prod.Annou.(R) 1985-2003/Jul 25
         (c) 2003 The Gale Group
File 636:Gale Group Newsletter DB(TM) 1987-2003/Jul 25
         (c) 2003 The Gale Group
File  16:Gale Group PROMT(R) 1990-2003/Jul 25
         (c) 2003 The Gale Group
File 160:Gale Group PROMT(R) 1972-1989
         (c) 1999 The Gale Group
File 148:Gale Group Trade & Industry DB 1976-2003/Jul 24
         (c)2003 The Gale Group
File 624:McGraw-Hill Publications 1985-2003/Jul 24
         (c) 2003 McGraw-Hill Co. Inc
File  15:ABI/Inform(R) 1971-2003/Jul 24
         (c) 2003 ProQuest Info&Learning
File 647:CMP  Computer Fulltext 1988-2003/Jun W5
         (c) 2003 CMP Media, LLC
File 674:Computer News Fulltext 1989-2003/Jul W3
         (c) 2003 IDG Communications
File 696:DIALOG Telecom. Newsletters 1995-2003/Jul 24
         (c) 2003 The Dialog Corp.
File 369:New Scientist 1994-2003/Jul W3
         (c) 2003 Reed Business Information Ltd.
File 810:Business Wire 1986-1999/Feb 28
         (c) 1999 Business Wire
File 813:PR Newswire 1987-1999/Apr 30
         (c) 1999 PR Newswire Association Inc
File 610:Business Wire 1999-2003/Jul 25
         (c) 2003 Business Wire.
File 613:PR Newswire 1999-2003/Jul 25
         (c) 2003 PR Newswire Association Inc

Set     Items   Description
S1      12961   RETICLE? ? OR PHOTOMASK? ? OR PHOTO()MASK? ?
S2         46   S1(5N)LIBRAR???
S3         20   RD (unique items)
S4         14   S3 NOT PY=2001:2003
```

4/3,K/1 (Item 1 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)

01772585 SUPPLIER NUMBER: 16812014 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Canon debuts wide-field stepper. (Canon FPA-3000iW) (Product Announcement)
Electronic News (1991), v41, n2049, p54(1)
Jan 23, 1995
DOCUMENT TYPE: Product Announcement ISSN: 1061-6624 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 725 LINE COUNT: 00058

... layer by Canon's digital measurement technique, featuring five-point observation and CCD line sensor detection.
The new stepper is equipped with a high-speed **reticle** changer with a **library** of up to 29 **reticles** . Six-inch reticle capability is standard. Wafer handling can be accommodated from either the left or right side of the machine. A reticle inspection system...

4/3,K/2 (Item 2 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)

01318318 SUPPLIER NUMBER: 07979148 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Nikon adds I-line, G-line steppers. (Nikon Precision Inc.) (product announcement)
Electronic News, v35, n1789, p30(1)
Dec 18, 1989
DOCUMENT TYPE: product announcement ISSN: 0013-4937 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 577 LINE COUNT: 00043

... 65 micron and a numerical aperture of 0.54, according to Nikon. Improvements over earlier models include beltless wafer handling, menu-driven software and extended **reticle library** offerings.
The G-line model also has four lens options: two G-line lenses with 15-square-mm fields and two I-line lenses, with...

4/3,K/3 (Item 3 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)

01311918 SUPPLIER NUMBER: 07584698 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Making lasting impressions with electronic publishing. (Solutions; General Electric Government Services automates)
Modern Office Technology, v34, n9, p32(2)
Sept, 1989
ISSN: 0746-3839 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 507 LINE COUNT: 00042

... money too: up to 40 percent on each executive summary.
With all the documents they have prepared, Johnson and his staff now have compiled a **library** of boilerplate paragraphs, **photo masks** , and other page composition elements. Valuable work time is saved as pertinent elements from this library can be copied into future summaries, eliminating much text...

4/3,K/4 (Item 1 from file: 621)
DIALOG(R)File 621:Gale Group New Prod.Annou.(R)

02246710 Supplier Number: 57889349 (USE FORMAT 7 FOR FULLTEXT)
Asyst Technologies Introduces New Reticle Management System; Shrinking Geometries Create New Market for Reticle Manipulation and Protection Platforms.

Business Wire, p0482
Dec 1, 1999
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 773

... of mask houses and semiconductor manufacturers, the RMS opens, identifies and transfers reticles from various shipper boxes. These include: Hoya multi-reticle cassettes; Toppan single **reticle** clam shells; ASML **library** /Asyst SMIF Pods; Asyst single- **reticle** SMIF Pods; and Nikon, SVGL and Canon boxes. A variety of options can be used due to the highly flexible design of the bulkhead-mountable...

4/3,K/5 (Item 2 from file: 621)
DIALOG(R)File 621:Gale Group New Prod.Annou.(R)

01877135 Supplier Number: 54653481 (USE FORMAT 7 FOR FULLTEXT)
Ultratech Introduces New-Generation Stepper Family for Advanced Thin-Film Head Production; XLS 9000-Series Platform Tailored for Advanced TFH Lithography.
Business Wire, p0106
May 18, 1999
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 752

... precision wafer stage, coupled with low-lens distortion, provides the colinearity needed to control the throat and stripe height of GMR thin film heads.
The **reticle library** for the XLS 9000-series has been expanded to handle up to 24 reticles of the standard 6-inch format. The user console has been...

4/3,K/6 (Item 3 from file: 621)
DIALOG(R)File 621:Gale Group New Prod.Annou.(R)

01344449 Supplier Number: 46130650 (USE FORMAT 7 FOR FULLTEXT)
Ultratech Stepper Receives Multiple Orders From Read-Rite; Systems will be used to manufacture data storage devices at Read-Rite's U.S.-based fabrication plants.
Business Wire, p2070025
Feb 7, 1996
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 428

... offers 80nm colinearity for improved throat height control.
The system also features a bar-code reader to verify the reticle used for each level, a **reticle library** allowing greater automation, and machine vision system (MVS) for optical alignment target elimination.
Ultratech's Model 2700 can be configured for 1.0 micron or...

4/3,K/7 (Item 4 from file: 621)
DIALOG(R)File 621:Gale Group New Prod.Annou.(R)

01312403 Supplier Number: 45875084 (USE FORMAT 7 FOR FULLTEXT)
Ultratech Announces Windows-based Stepper Management Program Atlas Optimizes Stepper Performance Based on Customer-Determined Reticle and Wafer Parameters.
Business Wire, p10230217
Oct 23, 1995
Language: English Record Type: Fulltext

Document Type: Newswire; Trade
Word Count: 610

... act upon information that is now readily available, thereby facilitating: -0-
-- Layout of the wafer, based on chip design -- Reticle layout and design -- Management of **reticle library** and wafers -- Alignment criteria -- Exposure energy -- Machine-related variables -0-
Atlas is compatible with all advanced steppers from Ultratech, which consists of the company's...

4/3,K/8 (Item 5 from file: 621)
DIALOG(R)File 621:Gale Group New Prod.Annou.(R)

01253070 Supplier Number: 44610846 (USE FORMAT 7 FOR FULLTEXT)
CANON INTRODUCES NEW I-LINE STEPPER FOR 64M DRAM MANUFACTURING
News Release, pN/A
April 20, 1994
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 451

... performance is assured by "fuzzy logic" parameter selection algorithms.
The FPA-3000i4 can be equipped with either a 5-inch or 6-inch high-speed **reticle** changer with a **library** of up to 29 **reticles** . Wafers up to 8- inches in diameter can be accommodated by the robotic handling system, which is available with an optional edge bead removal function...

4/3,K/9 (Item 1 from file: 636)
DIALOG(R)File 636:Gale Group Newsletter DB(TM)

01201211 Supplier Number: 41147502 (USE FORMAT 7 FOR FULLTEXT)
ASM LAUNCH 0.5 microm I-LINE STEPPER
Integrated Circuits International, pN/A
Feb, 1990
Language: English Record Type: Fulltext
Document Type: Newsletter; Trade
Word Count: 211

... access to certain Zeiss technology.
The PAS 5000/50 carries a base price of US$1.6 million with optional equipment, including wafer handling gear, **reticle libraries** , loaders and unloaders, colour video monitors and semiconductor equipment communications standard (SECS II) networking, available.

4/3,K/10 (Item 1 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

04064715 Supplier Number: 45917262 (USE FORMAT 7 FOR FULLTEXT)
Ultratech Debuts Stepper Software
Electronic News (1991), p066
Nov 6, 1995
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 484

... to interpret and act upon information now readily available, thereby facilitating: layout of the wafer, based on chip design; reticle layout and design; management of **reticle library** and wafers; alignment

criteria; exposure energy; and machine-related variables.
Atlas is compatible with all wafer steppers from Ultratech, which consists of the company's...

4/3,K/11 (Item 2 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

03657316 Supplier Number: 45163998 (USE FORMAT 7 FOR FULLTEXT)
Ultratech Introduces New $1.6M Stepper For Thin-Film Manufacture
Electronic News (1991), p42
Nov 28, 1994
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 286

... in TFH manufacturing.
The system also features 1-micrometer resolution and broadband illumination, including G- and H-line for better process latitude, and an automated **reticle library** , which incorporates a bar code reader to verify proper reticle loading.

4/3,K/12 (Item 1 from file: 160)
DIALOG(R)File 160:Gale Group PROMT(R)

02392876
ASM Introducing 0,5-Micron I-Line Stepper
Electronic News December 11, 1989 p. 30
ISSN: 0013-4937
FULL TEXT AVAILABLE IN FORMAT 7 OR 9 WORD COUNT: 297

... The PAS 5000/50 carries a base price of $1.6 million, with deliveries six to nine months ARO. Optional equipment includes wafer handling gear, **reticle libraries** , loaders and unloaders, color video monitors and semiconductor equipment communications standard (SECS II) networking.
ASML's dual alignment system incorporates a through-the-lens laser...

4/3,K/13 (Item 1 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

07567979 SUPPLIER NUMBER: 15864686 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Ultratech Stepper Inc. introduces next-generation lithography tool for thin film head manufacturing.
Business Wire, p11160008
Nov 16, 1994
LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
WORD COUNT: 494 LINE COUNT: 00043

... in TFH manufacturing.
The system also features 1 micrometer resolution and broadband illumination, including g- and h-line for better process latitude, and an automated **reticle library** , which incorporates a bar code reader to verify proper reticle loading.
About Ultratech: Ultratech Stepper Inc. designs, manufactures and markets photolithography steppers used worldwide in...

4/3,K/14 (Item 1 from file: 810)
DIALOG(R)File 810:Business Wire

0110038 BW120

NIKON PRECISION: Nikon introduces next generation wafer stepper

December 5, 1988

Byline: Business Editors

...been strongly considered in the design of this system including: beltless wafer handling; menu driven, user friendly software; high wafer throughput; as well as faster **reticle** exchange and extended **reticle library** offerings.

In preparation for future large wafer sizes, the system is capable of handling up to 8-inch wafers with improved yield and efficiency in...